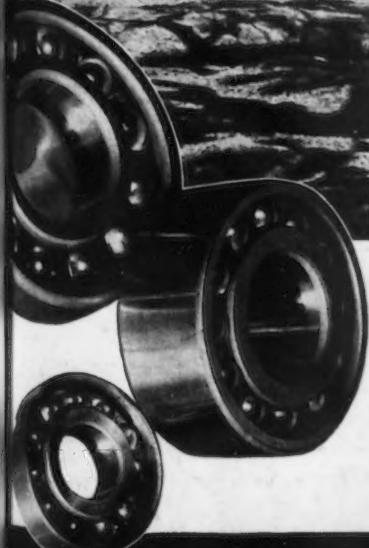
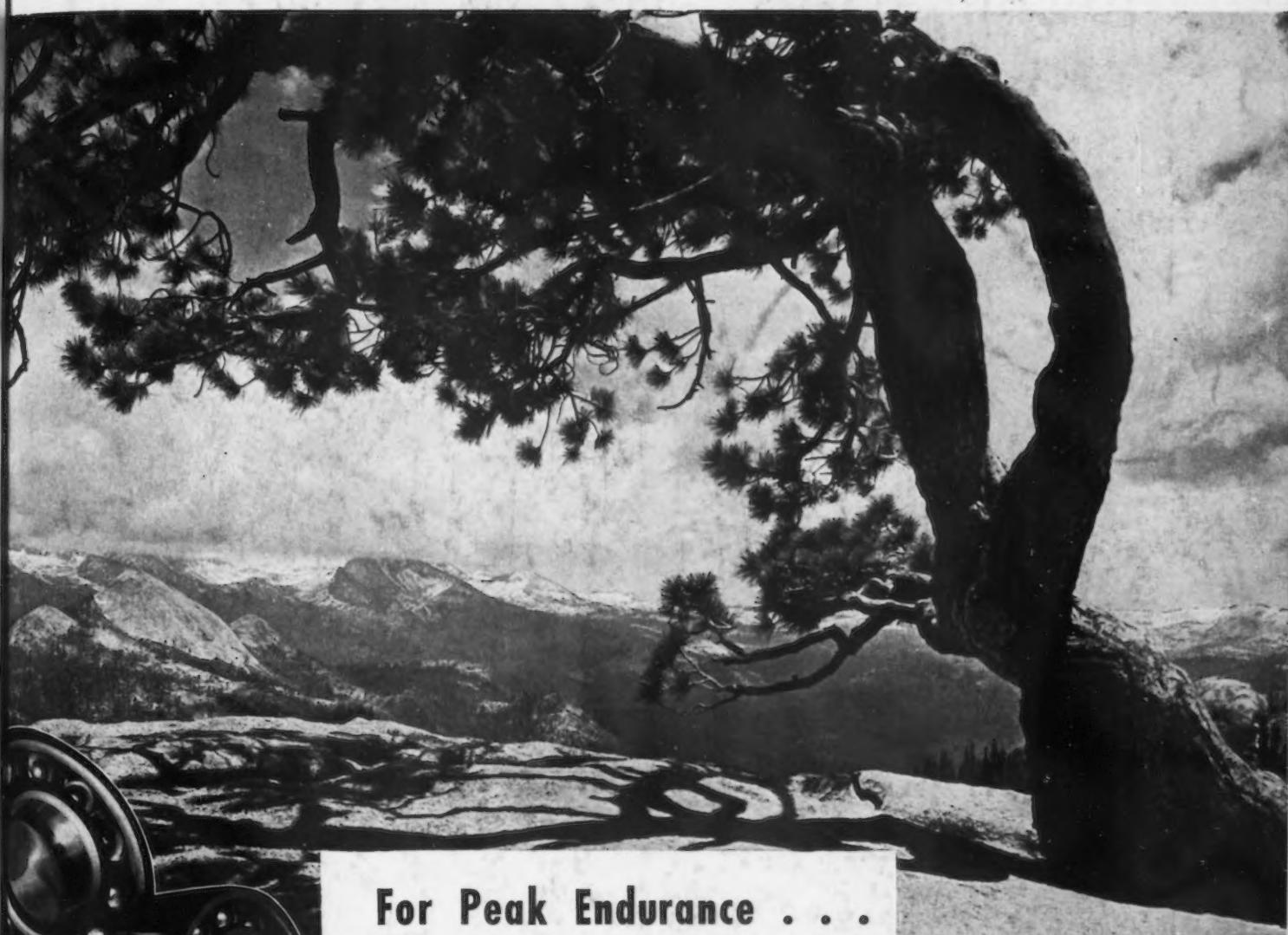


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THE IRON AGE



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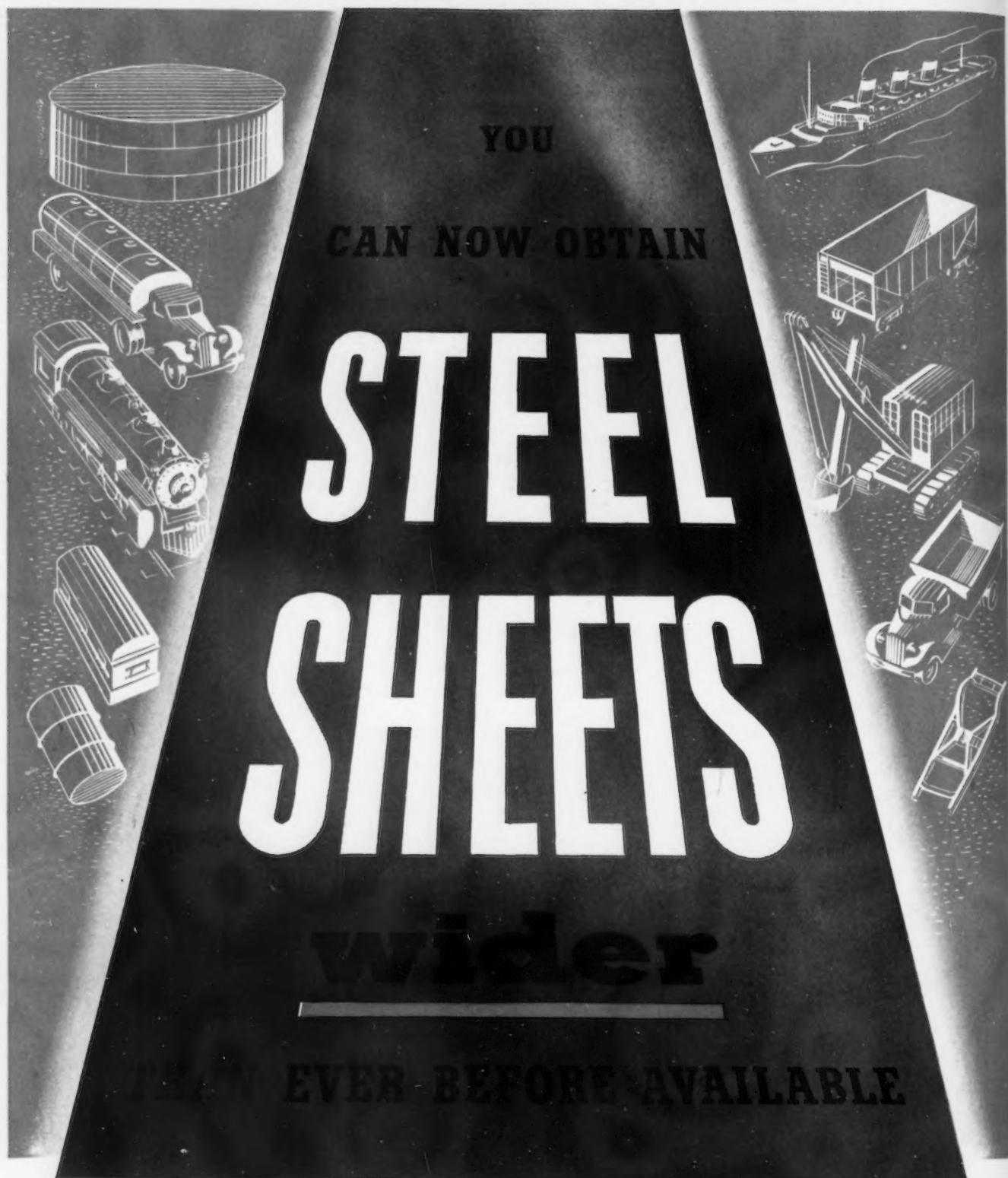
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2—THE IRON AGE, February 17, 1938

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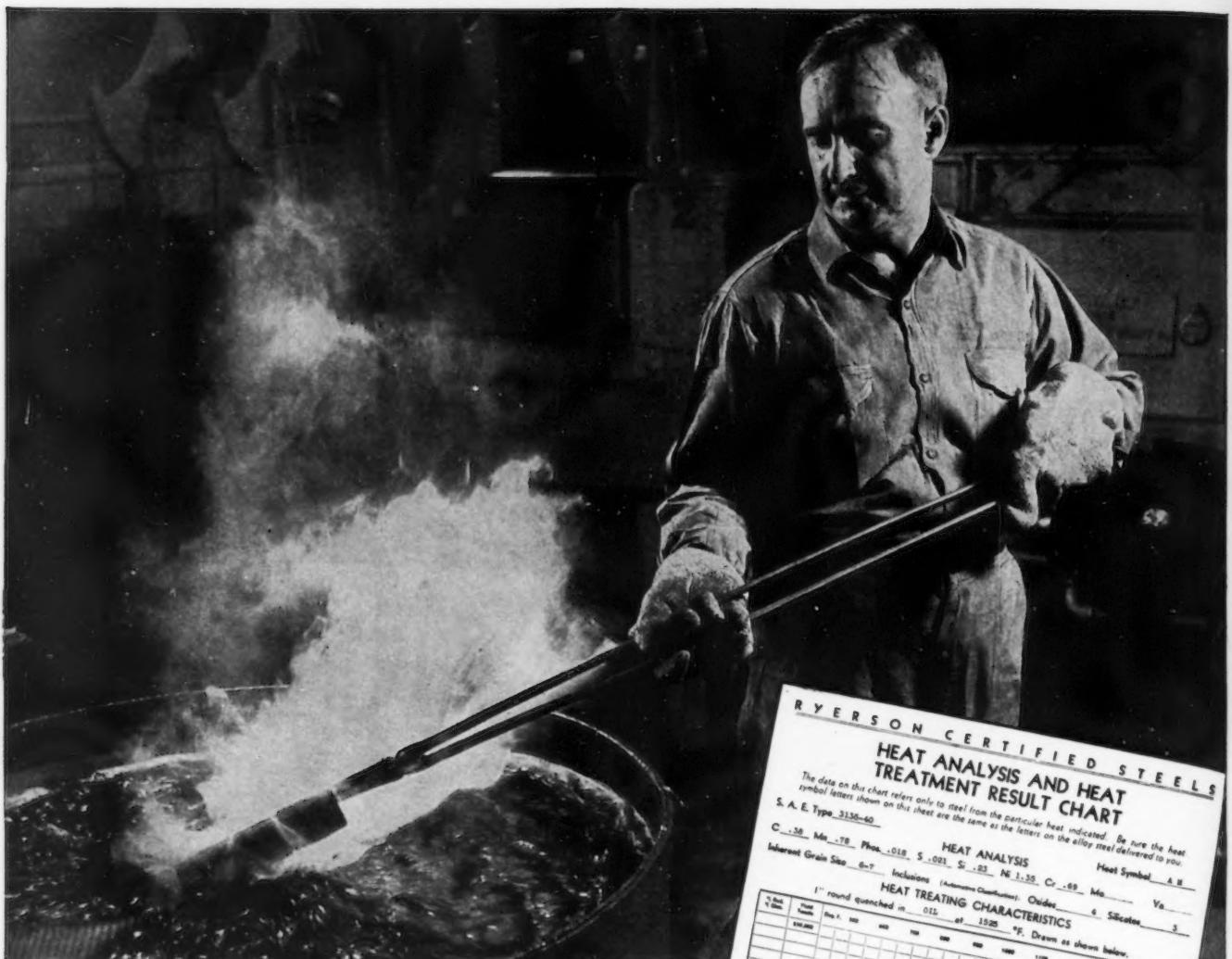
THE IRON AGE

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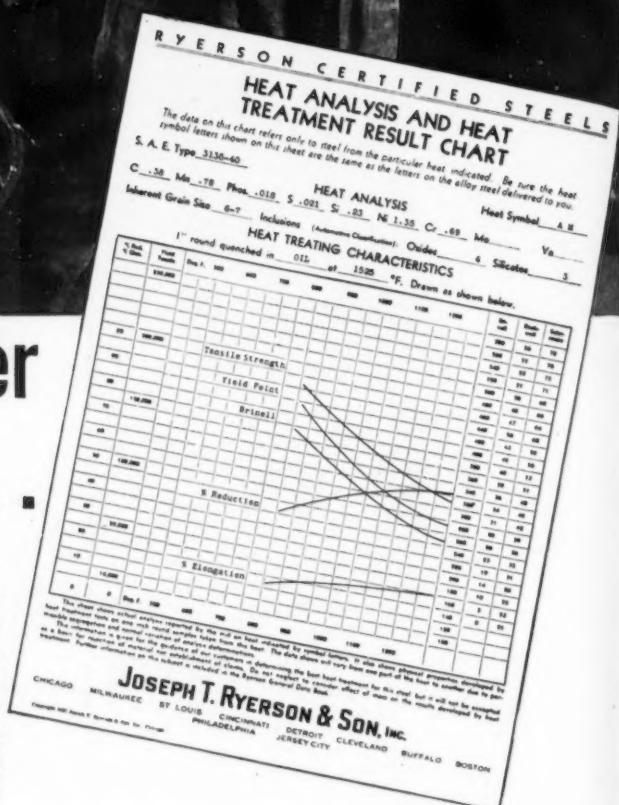


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... THE IRON AGE ...

ESTABLISHED 1855

FEBRUARY 17, 1938

Vol. 141, No. 7

The AFL Answers a Question

"**W**HAT has labor, particularly organized labor, which is articulate and influential, done to help employers to keep business good? Take the case of the corporate surplus tax act—." From "If We Don't Hang Together, We Shall All Hang Separately."

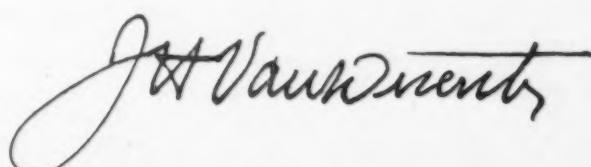
This question, asked in THE IRON AGE of Jan. 27, has now been answered by William Green and his associates of the executive committee of the American Federation of Labor. Out of their meeting at Miami, Fla., last week, came a resolution recommending that Congress repeal or modify the undivided profits and corporate surplus gains tax.

We are encouraged and gratified by this action on the part of America's greatest labor organization. And the gratification is not merely that the AFL has thus endorsed our own viewpoint and preaching; nor that by adding its influential voice to that of both big business and little business, labor makes it almost certain that this harmful and hastily conceived brain trust experiment in taxation will shortly go "out the window" and into the scrap pile where unworkable economic and legislative mechanisms belong.

The most encouraging thing about this action is its indication that unionism, in the AFL at least, has achieved the point of view beyond that of its usual function of bargaining for "position" and has recognized its deeper responsibility in working with employers for the common purpose of keeping business good or making it better.

When organized labor has reached the stage where it will fight shoulder to shoulder with business against whatever threatens the mutual interests of both parties, whether it be Communism or crackpot legislation, we may indeed look forward more hopefully to the preservation of our traditional liberties as well as to the maintenance of a higher level of business activity.

Employers would do well to recognize this forward step on the part of the AFL and to personally commend Mr. Green upon it.



Ludlite... Stainless

By T. W. LIPPERT

Metallurgical Editor, The Iron Age

STAINLESS, the Prince of Steels, has acquired a consort! Rolled down practically to foil gage, firmly wedded to an equally thin composition backing—with Ludlum Steel Co., Watervliet, N. Y., sponsoring the union—stainless at long last throws off the regal aura of a class metal to become a metal of the masses, a metal the common man can buy with convenience, use with facility, and even furbelow to his heart's content with the most elementary of tools.

That stainless steel is potentially a metal of unlimited demand is axiomatic, what with its inherent beauty, its longevity under the most brutal of corrosive conditions, and its great strength and exceptional hardness. This attractive picture is pretty well muddled, however, by hard realities such as the comparative costliness of the stainless alloys and by their being so devilishly difficult to fabricate. Special tools are practically a necessity and special handling technique equally essential, and woe to the neophyte who lugs home a heavy gage stainless sheet expecting to drill, cut, shape, or otherwise fabricate some trick convenience for the wife with the conventional tools found under the conventional cellar steps—he'll probably end up completely chastened or furiously demanding Federal control of the steel industry. There is thus on one hand a beautifully conditioned market for stainless steel in

this country, with the name a household term and the desirable qualities of the metal accepted by the mass markets, but, on the other hand, being expensive and refractory the outlets for the most part are confined to a few "producers' goods." And even though production is rising comparatively sharply and fustian seers describe a glowing future, the hard-headed steel maker has long realized that stainless alloys never will be tonnage metals until basic prices fall drastically (which is practically impossible), and, of lesser importance, fabricating technique undergoes constant simplification (which it is slowly doing).

This uncertain outlook for mass consumption of stainless steel has long been an irritant to Ludlum, a company which pioneered commercial stainless alloys in this country. But then, a breakdown of sales records seasoned with plenty of imagination developed the thesis that many existing uses of stainless as well as a multitude of possible applications demanded only that there be a stainless surface; and whether this surface be tissue thin or a foot thick is not pertinent, just so long as the outside skin is backed up by something with sufficient body to withstand service. This realization, therefore, indicates that the decision two years ago to experiment with the mounting of paper-thin stainless on a tough, flexible non-metallic backing was no mere happenstance, but was a conscious effort to solve two basic problems in one fell swoop. By using thin stainless, far more surface can be covered with a given amount of expensive metal, and, at the same time, the composite material can easily be cut, punched, or shaped with ordinary carpenter's tools, or stamped or embossed with the simplest of dies.

The new composite material, Ludlite¹, announced herein for the first time, is the result of the two years of experimentation. In its present form, it is one of the most versatile and attractive new products to enter the steel consumption markets for many a month, and it has merchandising angles most unusual for a product of the steel mill.

The flexible Ludlite is categorically a "consumers' goods," no mean attribute in itself when it is realized that the steel industry as a whole has hardly a nodding acquaintance with the all-important ultimate consumer, the two usually being only vaguely aware of each other through the ministrations of several intermediate jobbers and a few fabricators. Ludlite in rolls, as tile, as trim, as embossed strip will be merchandized through the corner hardware and the small mill supply house. The home craftsman and the home builder or decorator will find the material as convenient to purchase as, say, linoleum, and just as easy to apply, the all-important difference being that the stainless is infinitely more attractive and permanent when installed. Even an unskilled workman will find it a simple matter to plaster the composite stainless around a room just as he would wall-paper, or to line bins and boxes or cover shelves in pantries and kitchens, thus doing away with the far less durable, sanitary and attractive oil cloth, linoleum and wood conventionally used for such applications. Sinks and drain boards together with back panels and splash boards, more often than not eyesores, can now blossom out with stainless just as attractive as that in the wealthy man's home on the other side of the railroad tracks. Bathrooms and shower stalls can take on new beauty and permanence with Ludlite tile, and door push

¹ Ludlite (from Ludlum and light-weight) was coined to designate all forms of the new composition material. Now available are Ludlite tile and shingles, angles, channels and other small shapes, and practically any conceivable type of embossed or decorative flexible-back material in all lengths and in widths up to 27 in. Ludlite in rolls is mirror-surface, flexible-back material sold to hardware stores in 50-ft. lengths 27 in. wide. A related product, Ludlite metal lumber, is a composite of thin stainless sheet and a rigid backing, such as various thicknesses of wood veneer, or mineral board, the latter being a new proprietary product of high strength and density, completely fire-proof, negligible moisture absorption, but at the same time being exceptionally easy to work with carpenters' tools.

for the Hoi Polloi



A COUPLE OF YARDS,
a fraction of an inch, in
either case this new stainless
composite handles with the versa-
tility and ease of oil cloth or linoleum.

plates, tea wagon tops, small table tops, trays and wainscoting can be dressed up to satisfy the taste of the most esoteric interior decorator. All this can be done with nothing more than two moderately dexterous hands, scissors, a hammer, a straight edge, a can of cement, and a modicum of patience. And if the home owner really wants to ritz the neighbors he can give free play to the suppressed dilettante in his nature by using a glass cutter to emboss the stainless surface (either from the back or front) with a multitude of elegant ornamental designs, or even modest pictures.

Flexible Ludlite also fits into the "producers' goods" classification. The material is naturally not deep drawing, being so thin and being a composite assembly, but it will take an astonishing amount of abuse in a punch press. Already several manufacturers have found that either stamping or embossing presses turn out completely satisfactory name plates with excellent letter definition, as well as all varieties of plain or embossed trim for industrial equipment

and consumer products, as, for instance, vacuum cleaners, oil burners and refrigerators. The non-metallic backing has highly desirable heat, sound and electrical insulating properties, and the backing can also function in much the same manner as a gasket when Ludlite is used for cover plates, thereby keeping moisture and dirt out and if necessary keeping oil in. All these applications resulted from the initial cursory introduction to the fabricating trade, and further market research has brought forth a spate of possible additional uses, some of which are described in the following paragraph and some of which still remain uninvestigated.

The material readily fabricates into building hardware, such as push or kick plates, or name plates and house numbers, all for 5c. & 10c. store distribution, and all of which can be firmly cemented in place rather than requiring the use of unsightly screws. It is equally true that the material is a natural for electrical equipment, such as gang plates (electrical outlets), switch plates, or even electrical

socket shells, as well as for cover plates, trim or name plates on all types of electrical equipment, meters, etc. Many of the foregoing products in conventional form are supplied with separate composition insulation, which in Ludlite is already cemented onto the back of the stainless sheet. Ducts for commercial air conditioning units are an additional possibility, particularly for those units which undergo peak loading and suffer from excessive condensation which in turn results in quick rusting of ordinary steel ducts. Ludlite ducts, having a stainless interior, would suffer little from corrosion, and the non-metallic backing could serve as a sound-deadener to dampen out all annoying air rush. The furniture industry also could use the composite material, say, for trim, or as table tops, or as embossed inlay around the outer edge of card tables, etc., etc.

In the architectural field, the Ludlite engineers still have much to learn (as, for instance, how much to apply in one piece under various conditions), particularly regarding the in-



A GLASS CUTTER, STEADY HAND.

and some push are all that's necessary to emboss Ludlite. This wall panel parallelly lined will emphasize a room's décor moderne, although less severe designs or even pictures are as easily applied.

stallation technique for outside work exposed to drastic swings in temperature. Several such jobs, such as the Woolworth sign in the accompanying insert, have been watched closely during the past six months, and any number of do's and don'ts have been deduced thereby. Ease of application and durability have encouraged several designers to specify Ludlite for New York World's Fair projects, two of which are sizable outside applications. The material obviously lends itself to decorative store fronts, etc., where the service is not excessively abusive, or for cut-out medallions and decorative appliqués, either for interiors or for cementing onto windows. Shingles are now being produced, but still are undergoing rigid

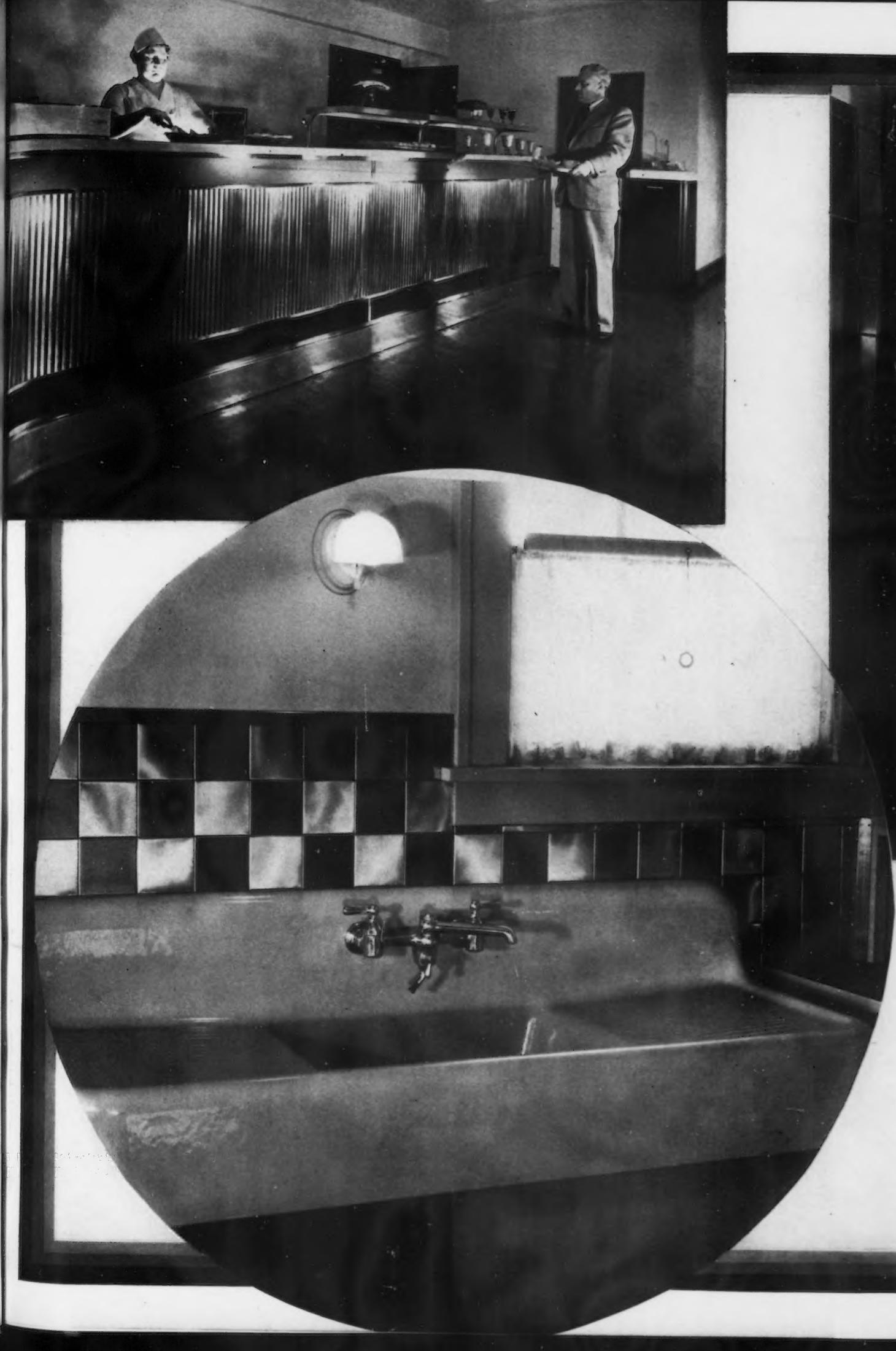
field tests. Such shingles are made in the more economical hexagonal shape, to take advantage of the maximum amount of exposed metal, rather than made in the square American plan pattern².

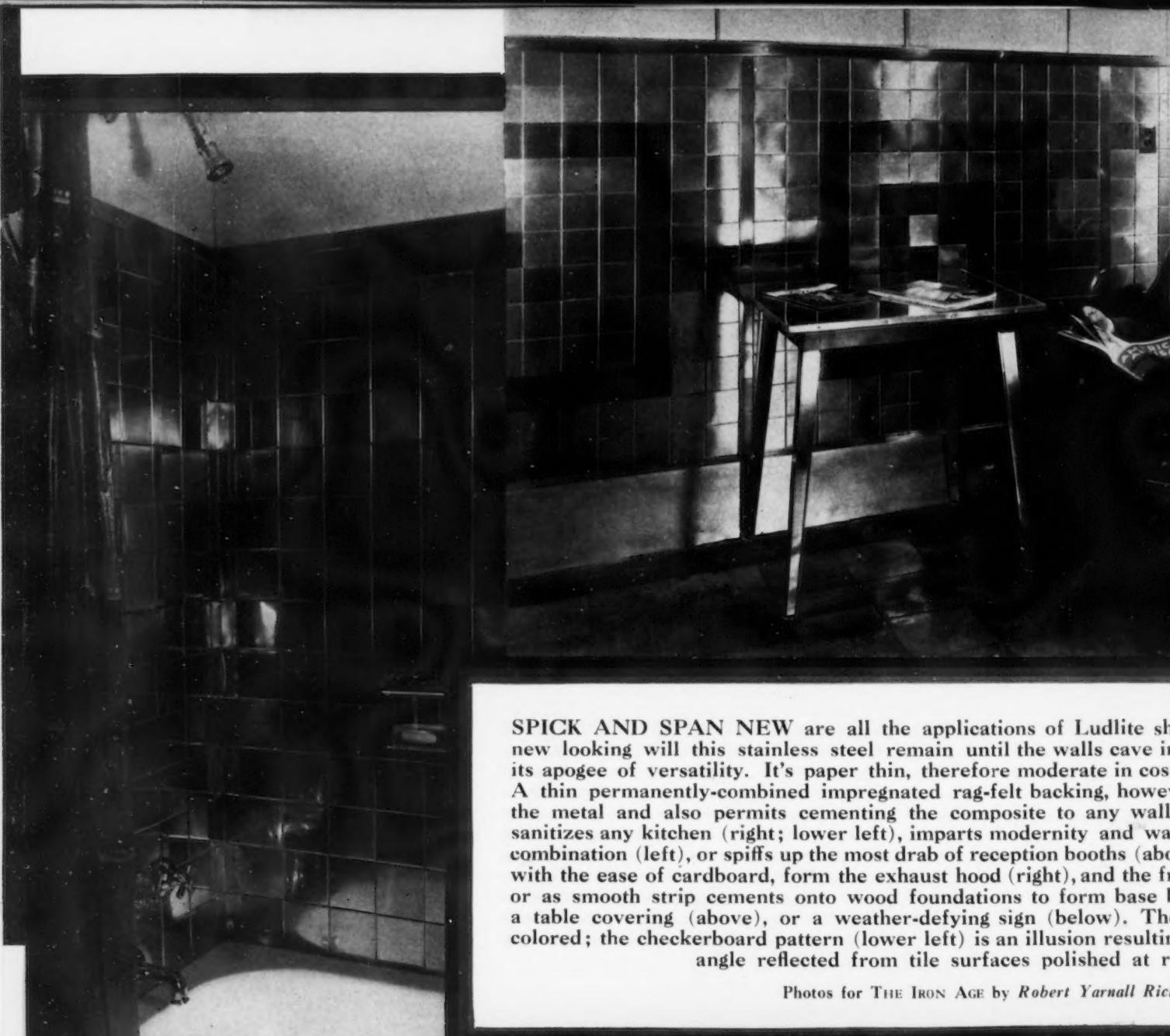
All the foregoing applications and qualifications of Ludlite for the fabricator, the architect and the home decorator are indicative of extreme versatility, and the status of the new composite material is even further enhanced by a quick recapitulation to emphasize anew and in a slightly different manner the two prominent aspects of the Ludlite development—(a) the product is directed for the most part toward unexploited markets, and (b) there is a highly desirable inherent advantage in being a consumers' as well as a producers' product, an advantage well nigh unique in the steel industry.

² It takes 87 hexagonal shingles (16 x 16 in. overall) to cover 100 sq. ft. of roof area; 160 square American plan shingles (8 x 16 in.) are required for 100 sq. ft. of protected roof.

To elaborate on (a): It is bitterly true that all too often the steel industry welcomes a new product only to find that it supplants some older type of steel product, the net economic return to the industry thereby being about nil. Seemingly, relatively too much of the steel maker's energy and money are sunk in the maintenance of competitive position, which in everyday language means hanging onto his customers or seducing some of the other makers' customers. Despite all the recent mammoth mills flung up all over the country, steel sales in aggregate have undergone little alteration, and more permanent advantage would probably ensue if proportionately greater effort had been directed toward perfecting entirely new outlets for steel, outlets which might offset to some extent recent competitive inroads of plastics and die castings. Only in part will Ludlite sales be made at the expense of other steel products (including heavy gage stainless), as the bulk of the potential applications are either in virgin territory, or encroach on the domain of composition board, ceramic tile, asbestos or slate shingles, oil cloth, linoleum, etc.; these latter products are in their zenith anyhow, and their displacement is of zero concern to the steel industry.

In elaboration of (b), consider the steel industry's unenviable position during a depression as a supplier of producers' goods, which is at best a secondary outlet totally under the influence of demand for consumers' goods. Therefore, when generally poor business conditions rule, steel outlets are inelastic, and even price manipulation will stir up remarkably little new business, even though one producer may gain thereof a fleeting competitive advantage. On the other hand, exploitation of a consumers' product, as for instance Ludlite, is susceptible to acceleration even in a recession, as emotional buying motives are rampant in this field and pricing has a direct influence on the purchase and use of the product. Ludlite has a definite emotional appeal, and its price is right, being competitive with all the established products now being used; and there is every chance that the price will in the future go through a downward spiral as increased output thins out unit production costs. Furthermore, being naturally a consumers' product, Ludlite's synonymous position as a producers' product is subject to constant enhancement. Industrial executives will become thoroughly familiar with its characteristics through applications in their homes, and by this indirect sampling process a foundation

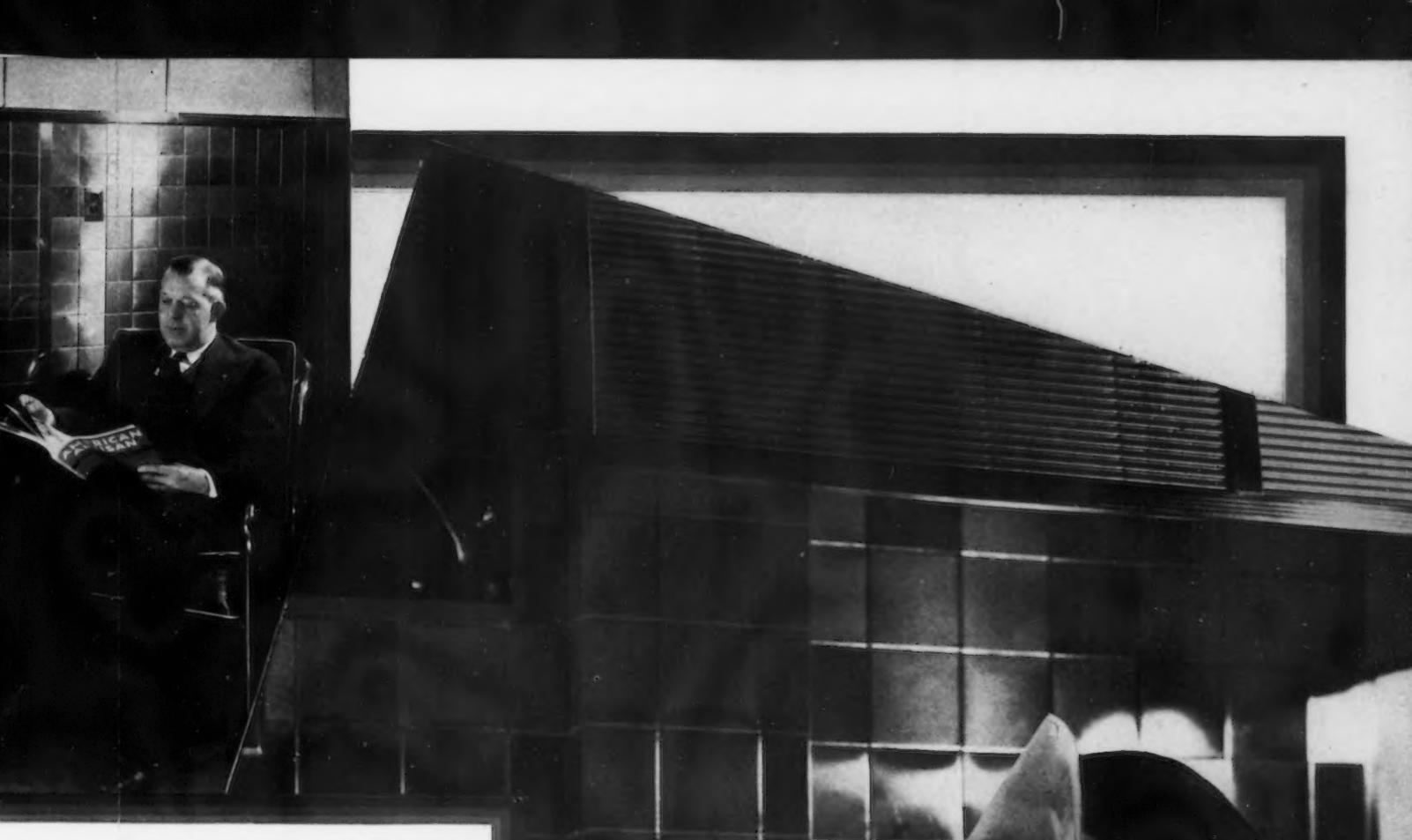




SPICK AND SPAN NEW are all the applications of Ludlite sheet metal. How long will this stainless steel remain until the walls cave in? In its apogee of versatility, it's paper thin, therefore moderate in cost. A thin permanently-combined impregnated rag-felt backing, however, protects the metal and also permits cementing the composite to any wall. It sanitizes any kitchen (right; lower left), imparts modernity and warmth to a combination (left), or spiffs up the most drab of reception booths (above). With the ease of cardboard, form the exhaust hood (right), and the flexible metal can be bent, cut, or as smooth strip cements onto wood foundations to form baseboards. Use it as a table covering (above), or a weather-defying sign (below). The Ludlite can be painted, or it can be left colored; the checkerboard pattern (lower left) is an illusion resulting from the angle reflected from tile surfaces polished at right angles.

Photos for THE IRON AGE by Robert Yarnall Richardson





Ludlite shown here, and spick and span walls cave in. Stainless in this form attains great in cost, easy to cut, punch and brake. Stamping, however, imparts necessary body to it to any wall. The 4-in. tile beautifies and adds to the beauty and water-tightness to a shower-bath booths (above). Ludlite sheets, corrugated and formed, and the front counter panel (upper left), form base boards (upper left; above), or below. The dark tile pattern (above), is due to reflection resulting from light at small incidence and finished at right angles.

Yarnall Richie.



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is laid for favorable action when the question of Ludlite's use as a fabricated article comes up for consideration in the executive's office³.

Marketing ramifications aside, a little attention should be given the problems encountered in the perfecting and making of the new flexible composite product. No substantial revision of equipment was necessary for rolling the thin stainless. Ludlum's subsidiary, Wallingford Steel Co., has for several years had a modern 4-high cold reducing unit capable of handling stainless strip up to 27 in. wide and in 1000-ft. coils. Two gages of stainless are rolled for the Ludlite assembly, one being 0.008 in. thick for purely decorative applications, and one being 0.015 in. thick for applications which must withstand considerable abuse in service. Two analyses also are made, one being the straight 17-chromium type which has found such widespread application for automobile decoration, the other being the 18 chromium-8 nickel type for withstanding particularly severe corrosive conditions.

It is no simple matter to roll stainless down to 0.008 in. in widths 27 in. wide and uniform throughout a 50-ft. length, as Ludlum quickly found out. Roll design had to be revamped somewhat, a sizable back tension has to be built up on the feeding reels, and a carefully deduced operating cycle has to be rigidly adhered to throughout the many reducing passes. At first, uniformity of gage was far from what was desired and there was considerable waviness throughout the coil length, but both these undesirables have subsequently been minimized and are no longer pertinent production problems.

When the paper thin stainless leaves the cold mill, it is passed along to polishing equipment⁴, whence it leaves with any one of a variety of surface textures, from a mirror to a matte finish. This surface is protected throughout all subsequent manufacturing and installation operations by a temporary covering of paper held by rubber milk to the steel surface. While on the subject of surface finish, it might be well to point out that Ludlite, as well as all types of stainless, would benefit tremendously by some coloring process which at the same time would have no deleterious effect on the stainless properties of the steel. There has been a great deal

³ This is not far-fetched. Much effort and money have been expended by International Nickel Co. in establishing monel metal in the home to encourage favorable reaction when industrial possibilities are suggested to executives.

⁴ A new technique shows considerable promise for reducing costs radically, increasing speed, and even improving surface corrosion resistance.



WORKING FROM A CORNER.

cement has been applied to this wall with a grooved trowel, and, when tacky, the stainless tile are thus firmly pressed in place. The one decorative square was hand-made and the pattern is in relief; for the impression was made from the back, using a glass cutter as a die.

of effort expended on giving the surface an integral color (something on the order of case hardening or nitriding), and even though many widely scattered experimenters have found their research fruitless, there is good reason to believe that at least the rudiments of a promising process may soon be introduced to the trade. Of course, stainless can be lacquered, painted or sprayed with colored metals, but to the esthetic such procedures smack too much of, "to gild refined gold, to paint the lily."

The polished thin stainless, which has a medium temper, is then ready to be joined with a non-ferrous backing, and a special continuous combining machine to handle widths up to 36 in. has been designed by Ludlum. The stainless enters this ma-

chine, has one surface sprayed with an adhesive, and then is rolled against the non-ferrous backing (which is traveling at the same speed), and the composite material leaves the machine to be wound on reels, all at the speed of 150 to 200 ft. per min.

The perfection of the proper non-ferrous backing and a completely satisfactory adhesive were problems of no mean caliber, and necessitated over a year's constant experimentation and the calling in of skilled consultants on adhesive chemistry and composition structure.

The final backing selected for the very flexible material is about 0.04 in. thick and is of the impregnated rag-felt type. It gives excellent body and support to the thin stainless surface,

and in any amount of ordinary handling there is little chance of buckling the assembly. In selecting an adhesive, an attempt was made to secure excellent flexibility at low temperatures, say, -20 deg. F., but in driving for this low-temperature adhesiveness

maximum flexibility it is necessary to stay up around 65 deg. F.; on the other end of the scale, the bonding qualities suffer no damage at temperatures up around 300 deg. F. It is impossible to tear the backing away from the steel surface, although ex-

cepted, is bonded with the steel; the fibers have considerable "give" and the backing holds together admirably in all modest stamping or drawing operations. The latex paper backing is used only where specifications require it, as cost is slightly higher than for the impregnated rag-felt.

Metal lumber, i. e., thin stainless mounted on rigid backing, is not entirely novel, although the Ludlite type used a thinner stainless surface than several other types. The Ludlite metal lumber uses all thicknesses of veneer wood backing, or various thicknesses of a composition mineral board (the latter a new product on which Ludlum has patent rights). Inasmuch as the steel surface is very thin and the mineral board unique in that it is dense without being stone-like, the metal lumber can be worked with ordinary woodworking tools, that is, sawed with a band or hand saw, punched with a nail, or fitted in place like ordinary lumber; in the latter instance there is an advantage over lumber, as corners can be turned without a break in the surface, by sawing out a V-shaped section of the wood or asbestos backing and then bending the steel surface.

All the pictures on the accompanying insert show applications of Ludlite which are rather professional in appearance, but they all were applied either by unskilled labor or by tyro decorators. No difficulties should be encountered in applying if a few simple rules are followed. The sheets of Ludlite may be cemented (preferably with a special damp-proof cement packaged to sell with the composite) to practically any surface, such as plaster, wood, fiber-board, plaster board, metal, concrete, or even over wall paper, if the paper is firmly applied and has been thoroughly shellacked. Of course, the better the surface, the better the installation. High spots and depressions should be removed, grease taken off with gasoline or cleaning fluid, glazed painted surfaces should be roughened with sandpaper, and calcimine paint should be washed off.

For applying a wall covering a level mark should be made around the wall as a guide, all openings for pipes or switches should be cut out of the flexible metal prior to application, and necessary forming or bending (braking) can be done on a standard brake, or the composite may be formed by clamping between two straight boards and bending with the hands. Cement is then applied to the surface, preferably with a grooved trowel, and the composite Ludlite then may be slapped onto the wall. A light going over



SNAP-ON MOLDING

is used to good advantage for joining different sections of a Ludlite installation. An ordinary steel track is nailed to the wall at the joint, and a stainless molding either slides or is snapped in place. The wavy texture on the stainless surface (lower right) comes from "tracking" of the polishing brushes and serves to diffuse reflected light somewhat.

it was found that too much flexibility at high temperatures had to be sacrificed. A compromise then was made in order to secure maximum flexibility at temperatures at which most of the material would be handled. The adhesive now used is a latex-asphalt combination and has admirable bonding qualities below 0 deg., but for

treme effort may serve to rip the backing itself apart.

If the composite material with the impregnated rag-felt backing were to be put through a punch or embossing press, the backing would be found to break open at points of severe stress. Therefore, a substitute backing, latex paper about 0.03 in.

with a rubber roll immediately will result in better adhesion and a smoother fit. Joints can be made between pieces of metal either by soldering, or by using snap-on molding, as illustrated herein. Stainless snap-on moldings offer a large variety of shapes to choose from and have the unique feature that nails or screws do not show in the finished installation. A small steel track is nailed into position over which the molding is pressed in place.

For covering shelves or lining drawers, a heavy paper template should be cut to size to facilitate the accurate cutting of the Ludlite. The composite metal then can easily be bent to correct shape without danger of spoilage. For shelf covering work, a special stainless division strip has been designed. The first width of Ludlite is installed in the usual manner, after which—along the side which will abut the next section—the division strip is slipped half way under the metal and tacked on the exposed side. The next section of the Ludlite is then slipped into the division strip and covers the tacks. It is also possible to cover joints in a less expensive manner simply by cementing on a narrow strip of Ludlite. When the wide composite is slit at the plant into standard narrow widths, the edge rolls over (due to the spread in shear resistance between the surface steel and the backing), and there is thus no raw edge. There is the same smooth edge in right-angle and channel molding formed from the narrow strip.

The 4-in. square Ludlite tiles are particularly easy to install. Careful job layout and wall preparation is as essential as for the wide composite strip. When water tightness is a factor, such as in a shower stall or a wainscoting around a tub, the corners should be fitted with a bent stainless tile and a little more adhesive should be used in order to completely fill all joints. For walls prone to crack, as for instance those in older houses or even in new structures with uncertain foundations, the stainless tile has a major advantage over ceramic tile or structural glass. The latter two popular materials are rigidly applied (and demand highly skilled labor), and frequently split at corners or open up with wall cracks. Stainless tiles, however, are individual units individually applied and have comparatively far greater "give." Thus, a water-tight and sightly exterior is maintained at all time despite the minor breaches which may develop in the supporting wall.

The accompanying picture shows

how enough cement is applied with a grooved trowel to take care of about ten tiles at a time, and how the metal tile can be quickly snapped in place and pushed up tight against the neighboring units. Joints between tile and continuous pieces of composite metal

For decorative color contrasts, it is even possible to resort to combinations of Ludlite with other metals, as for instance copper or brass. In this way the monotony of a stainless wall of large area may be relieved by red or yellow figure appliqués, or even inlay.



A STAMPING PRESS

handles the composite stainless with ease. Shown here are a pile of tile (upper right), a toy badge (nearby), several instrument covers, a hot plate pad, and a couple of ash trays. Along the top are four embossed strips of the type used for decorative work.

are easily made with snap-on stainless molding, and the top course can be finished off with a stainless cap molding. Pictures with this article also show how a glass cutter can be employed to emboss designs on tile, or straight decorative lines, or even pictures on larger pieces of composite metal.

But this technique is advisable for applications subject only to minor corrosive conditions. Considerable decorative contrast without compromising corrosion resistance is readily available by using Ludlite with various embossed surfaces or with surfaces polished to a variety of different textures.

Selective Hardening of Ferrous

Metals with the

FOR years industry has been searching for a means of applying a hard wearing surface on a resilient core and in its search many methods of surface hardening have been developed. These methods embrace such operations as carburizing, cyaniding, aerocasing, nitriding, Chapmanizing, and several other patented applications.

Each of these case hardening operations requires the addition or absorption of other elements effecting a chemical change in the surface of the material.

With the exception of nitriding, all of these processes require prolonged heating at elevated temperatures in salt baths or special furnaces and require the selection of a steel which is not high enough in carbon or alloying elements to harden the core on the quenching operation.

These long time cycles at elevated temperatures usually result in excessive distortion involving expensive straightening operations or costly machine work where extra stock had to be allowed to take care of the anticipated heat-treating distortion.

The nitriding operation is confined to special steels containing elements favorable to the formation of nitrides. In this process nitrogen is introduced into the surface of the steel by heating the work in a closed retort through which ammonia gas is passed. The parts are held at a temperature of 977 to 1112 deg. F. for a period of 18 to 100 hr., depending upon the depth of case desired.

All of these processes have their specific fields and each is practical for its particular application.

IN making possible the surface hardening of many parts heretofore considered impractical, flame or torch hardening provides the metal-working industry with a new tool. In this article, from a paper presented by Mr. Rolf at the recent 38th annual convention of the International Acetylene Association, the place of this process in relation to other methods of surface hardening is discussed, and data are given on suitable steels and on methods and equipment employed. Application of the process, it is pointed out, covers a wide field.

Furnace Method Economical for Mass Treating of Small Work

For mass heat-treating of small or medium sized objects, which are to be uniformly hardened all over, the furnace method is beyond question the most efficient and economical.

If the hardening of metal surfaces could be accomplished without the addition or absorption of another element and if this could be accomplished in a very short time cycle, measured in minutes instead of hours, and if we could apply this method to any part instead of the entire piece and with this method we could reduce distortion to a negligible degree, then we would have made a definite contribution to industry.

With this ideal method whereby a

hard surface can be produced on a tough core without the addition of other elements, all that is necessary is to select a steel of proper analysis, locally heat the surface rapidly above the AC₃ point to a desired depth and then quench.

Today we have two such processes, the Tocco process, which is the induction method of heating, and the oxy-acetylene flame or Shorter process.

This paper deals with the latter method.

Flame hardening must be differentiated from case hardening, carburizing, nitriding or any other practice which involves a chemical change in the surface of the material.

This method consists primarily in rapidly heating the surface of the part being treated to the proper hardening temperature with an oxy-acetylene flame and quenching from that temperature. This imparts a hardened case to the surface of the metal without altering its chemical composition. This case may vary in depth from a mere skin to $\frac{1}{4}$ in., according to the operating practice and the type of material being hardened.

Steels for Flame Hardening Applications

Steels are commonly divided into two classes, straight carbon or alloy steels. The former differ from the latter in that they are made up almost entirely of iron, together with more or less iron carbide, and contain small amounts of such elements as manganese, sulphur, phosphorus and silicon, while the alloy steels have in addition to the above, appreciable percentages of alloying elements such as chromi-

• • •
By R. L. ROLF

Metallurgical Engineer, Lakeside Steel
Improvement Co., Cleveland

Oxy-Acetylene Flame

um, nickel, vanadium, molybdenum, tungsten, etc.

Commercially, steel varies from as low as 0.10 per cent carbon for sheet steel to about 1.75 per cent carbon for certain types of tool steel.

Very low carbon steel, less than 0.10 per cent C, is known as a very mild or extra mild steel.

Low carbon steel, carbon 0.10 per cent to 0.25 per cent, is known as mild steel, case hardening steel, or more generally as low carbon steels. These steels will not respond to the simple heat treating operations of heating and quenching, and should not be considered for flame hardening applications.

Medium carbon steel, 0.25 to 0.60 per cent C, is termed high carbon machine steel or medium carbon. This group is selected to provide some definite property and in many cases subjected to heat treatment to bring out certain physical characteristics. Steels in this group lend themselves to torch hardening, although for best results the carbon content should not go below 0.35 per cent. Steels with a carbon content of 0.60 to 1.50 per cent are known as tool steels, the range 0.80 to 1.00 per cent being usually held for ordinary tools, while some of the extra hard tool steels for special purposes contain over 1.25 per cent carbon.

Flame hardening should not be attempted on parts fabricated from any materials within the above classification as there is considerable danger of surface checking or cracking.

Table I gives the approximate chemistry of steels which have been successfully flame hardened.

The low alloy steels appear to be the most desirable as these materials usually harden to a good degree and except for certain types they may be heated and quenched without danger of cracking. Steels in the higher alloy category present a more difficult problem and many are to be avoided.

Fine grain steels with only a slight

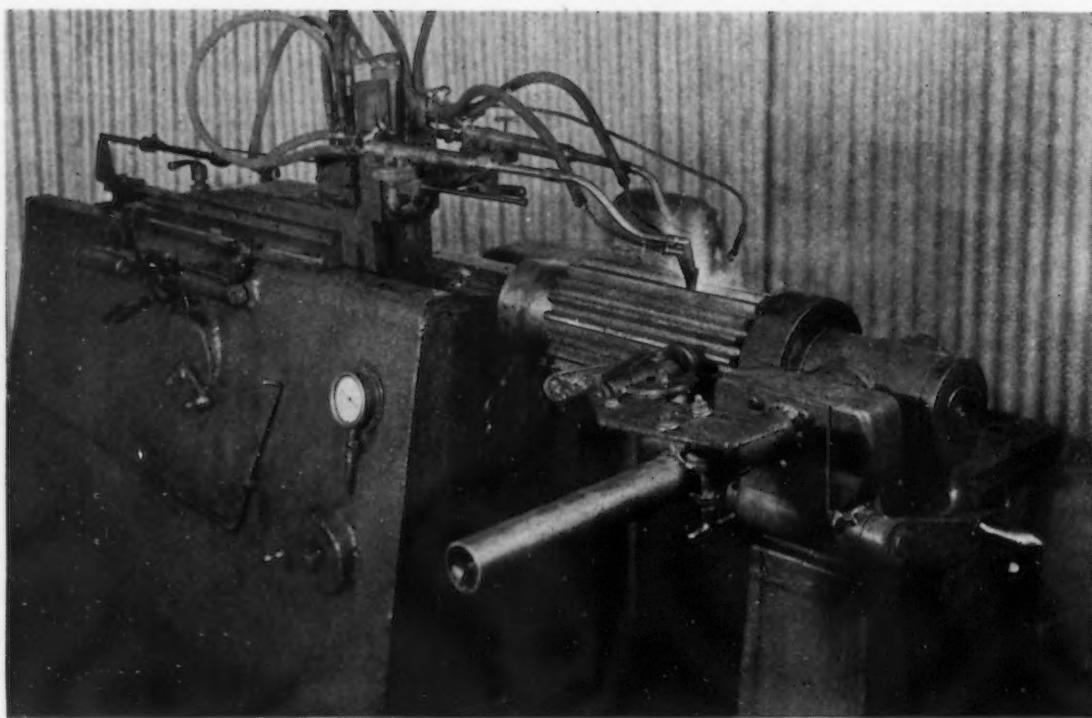
abnormality and having a McQuaid-Ehn rating of 6-8 are preferable, as this combination develops a martensitic structure in the hardened zone without the usual martensitic cracks.

While steels in the "as cast" or "as forged" state may be successfully treated, for best results the parts should first be heat-treated either by

• • •
THE wearing surfaces of bevel gears are torch hardened without affecting the toughness of the core.

• • •





• • •
FLAME hardening brings new applications in the heat treating of metals.
 • • •

quenching and drawing to a sorbitic structure, or by normalizing to produce a grain size which closely approaches the heat-treated structure.

In addition to the standard S.A.E. grades of steel, materials such as Cromansil, graphitic steels, alloy irons and air hardening steels respond very readily to this means of hardening.

Proper Surface Condition Important

Since flame hardening is only surface hardening and only a comparatively thin layer is treated, it is of vital importance that this surface be in the proper condition to respond successfully to hardening.

As previously mentioned, steels should contain at least 0.35 per cent carbon, with this requisite amount at the surface. In the process of forging, casting, normalizing, annealing or some thermal treatments, the carbon may be extracted from the surface

of the material leaving a decarburized layer which will not harden as this zone may be entirely void of carbon or the percentage reduced below the hardening range.

It is essential that decarburized surfaces be removed prior to the hardening operation; otherwise soft spots will occur in these particular zones.

Pits and blowholes should be avoided, but there are instances where they may be covered by a very thin layer of surface material which will fuse when the torch is applied, leaving the blowhole exposed. This is a material defect and is not the fault of the operator.

Seams and laps are material defects which have to be avoided as these most generally develop cracks during the quenching operation.

Scale has a retarding influence, and where maximum hardness is desired the surfaces should be thoroughly

cleansed before submitting to the hardening operation.

In general do not expect to flame harden with success, materials containing defects which could not be hardened by the more common methods without encountering trouble.

Water Quenching Most Common

Quenching mediums are at present confined to either air or the aqueous solutions.

Water is the most common quenching medium, but there are instances where a more severe quench is desired. In such cases, caustic or brine is substituted. For milder forms of quenching hot water, soap solutions, soluble oil or a spray may be used, while an air blast may be employed on air hardening steels.

With these limitations in quenching mediums, we are restricted to steels in the water hardening category. Experimental work is in progress attempting to find a means of quenching whereby the scope of the application may be broadened.

Four Methods of Torch Hardening

The methods used in torch hardening depend primarily on the nature of the work treated. There are cases where this operation must be performed by hand; except for these, practically all torch hardening operations can be made mechanical.

The hardening methods may be divided into four groups:

TABLE I—Chemistry of Steels Which Have Been Successfully Flame Hardened

S.A.E. No.	C	Mn	Cr	Ni	Mo	Va	Si
1000 Series	0.35-0.60	0.60-0.90					
1300 Series	0.25-0.40	1.25-1.90					
3100 Series	0.25-0.45	0.50-0.90	0.45-0.75	1.00-1.50			
3200 Series	0.25-0.45	0.30-0.60	0.90-1.25	1.50-2.00			
3300 Series	0.25-0.45	0.30-0.60	1.25-1.75	3.25-3.75			
4100 Series	0.25-0.45	0.50-0.90	0.50-1.10		0.15-0.25		
5100 Series	0.25-0.35	0.30-0.60	0.60-1.10			0.15-0.25	
6100 Series	0.25-0.45	0.30-0.90	0.80-1.10				0.80-1.00
Cromansil	0.25-0.45	1.00-1.20	0.40-0.60				

I.—Stationary methods or spot hardening when the blowpipe and work are stationary during the treatment.

II.—The progressive method, where the torch travels along the face of the object, such as gear teeth or track rails.

When hardening plane surfaces a blowpipe with a head of sufficient flame area to cover the path of the section being treated is directed against the surface of the work and then moved at the maximum speed which will bring the surface of the material to the desired hardening temperature. Immediately following the flame is a stream or spray of water which progressively quenches the heated surface.

The blowpipe is usually designed for the specific job, considering the width and shape of the path, the material being treated, etc.

While the usual speed of operation is between 6 and 8 in. per min., it may vary from 4 to 10 in. per min. depending upon operating variables such as flame intensity, material being treated and the hardness and depth of penetration.

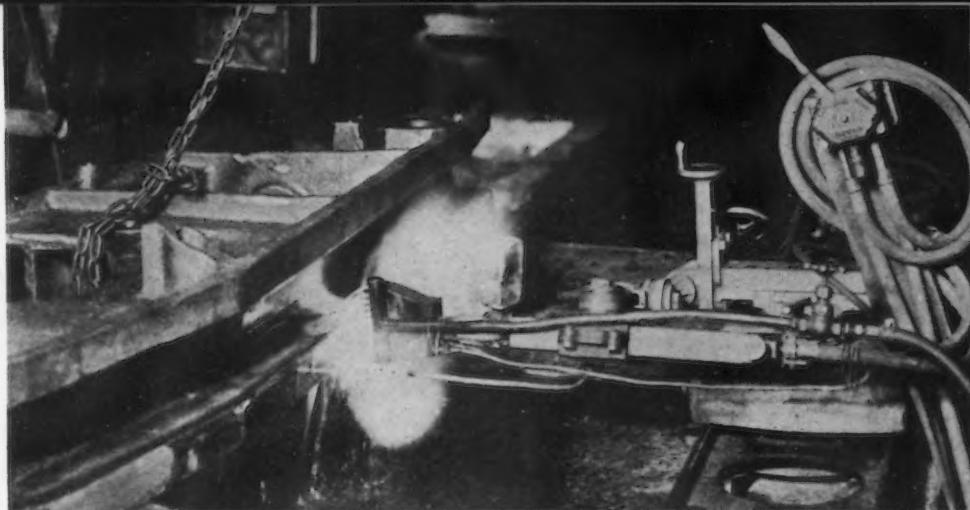
The blowpipe head should be adjusted so that the tips of the inner cones are $1/16$ to $1/8$ in. from the surface of the work.

III.—Spinning method, where the specimen to be hardened is spun or rotated in front of a stationary flame. We may subdivide this method according to the speed of rotation:

(a) Large circular work where the specimen is rotated very slowly in front of a stationary blowpipe. This method usually leaves, at the starting and stopping point, a narrow oblique path which is generally two or three points softer than the adjacent hardened area.

(b) This subdivision covers the spinning of the work at a fair rate of speed (between 70 to 150 r.p.m.) in front of one or more blowpipe. When the entire area has reached the proper quenching temperature the spinning specimen is quenched by permitting it to spin under a cooling spray or by ejecting the part from the machine into the coolant selected. This method is most generally adapted to the hardening of small rollers, or pinions having very small teeth.

IV.—The combination method combines the progressive and spinning methods and is applied to rounds where a considerable area is to be treated. In this the work is rotated before the blowpipe which gradually traverses the piece longitudinally.



• • • **P**ROGRESSIVE flame hardening of conveyor rails.

Several types of flame hardening machines are being used in the United States, the Gleason type, the Sykes Gear machine, the monitor type, and the universal type.

Several Types of Equipment

The monitor type, probably the most widely used for progressive hardening, consists of mounting the torches on one of the standard oxy-acetylene cutting machines. The speeds used in torch hardening coincide with those obtained on the cutting machines, thus making this an ideal traversing device.

Probably the most recent addition to the art is the universal machine which is an all-purpose type and with the exception of indexing is completely automatic in operation. The machine is designed to carry the torches on a slide operating in a horizontal plane. The speed of the movement is governed by a regulator which automatically increases or de-

creases the speed of the torches as they progress along the face of the work, thus compensating for heat induction and thereby assuring uniformity of temperature and depth of case. In conjunction with the controlled forward movement, the machine is designed with a rapid return.

Designed for Rapid Change-Over

The equipment is designed for rapid loading and unloading. About $\frac{1}{2}$ hr. is all that is required to make a complete change-over from one design to another and about 5 min. to complete a change for duplicate parts.

This machine will accommodate work up to 24 in. in diameter and all types of gears up to the same dimensions. The gears may be of all types, such as spiral bevel, straight bevel, herringbone, helical, spur and mitre.

In addition to parallel sections this machine is capable of handling

(CONCLUDED ON PAGE 52)

• • • **G**EAR teeth are quickly and accurately surface hardened by the oxy-acetylene process.



Tiering and Stacking Equipment

Chapter 25 of a Series on the Economics of Materials Handling Methods and Equipment.

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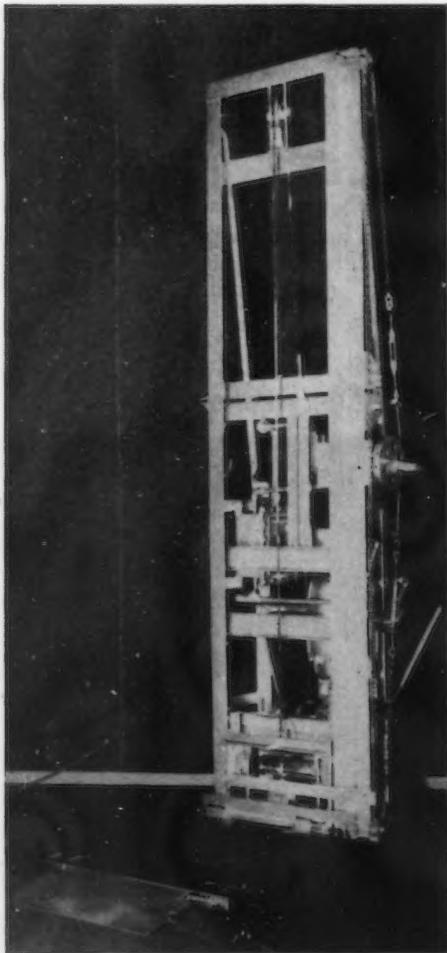
IN recent years a new dimension has been added to storage capacity. To the age-old length and breadth of the storage room, a means has been developed for effectively using height also; thus making possible and practical the use of the entire cubical contents of storage space, from floor to ceiling, instead of merely the square area of the floor up to such a height as might easily be reached by

a man's unaided efforts. Now, this statement must not be construed as meaning that no one ever did pile goods and parts on top of one another before modern tiering and stacking equipment was developed. They did; but at a cost for manual handling, involving time, enormous waste of effort, and labor out of all proportion to the results secured. Not until adequate mechanical handling equipment was developed was the factor of height of storage space effectively utilized along practicable, low-cost lines.

It has been said that storage space rentals are figured on a square foot

basis, but that the practical utilization of such space must be considered on a cubical contents basis. Manifestly, an area of 10,000 sq. ft. over which storage may be effectively handled to a height of 5 ft., costs twice as much as the same area over which storage may be just as easily handled to a height of 10 ft. And if, in addition, the handling of goods by a system which permits the 10-ft. height also makes all handling possible at lower labor costs, still another saving is to be credited to the use of the modern system.

There are, in general, three storage needs in any manufacturing plant. The



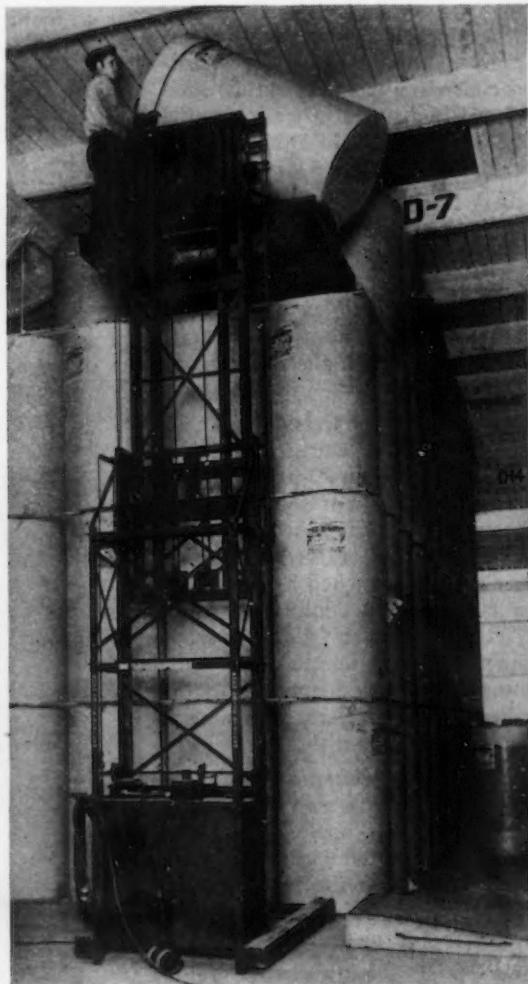
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FIG. 1—Revolvator Co. high-lift elevating mechanism with steel-plate platform dropping to within 2½ inches of the floor.

• • •

AT RIGHT

FIG. 2—Lewis-Shepard electric worm-drive portable stacker with telescoping frame, as used to stack bulky rolls of paper on end, four high.



To Cut Storage Costs

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

first is required before any manufacturing work proper is done. It is always necessary to accumulate a stock of raw materials, so that manufacturing operations will not be brought to a stand-still in between the receipt of shipments of such materials to the plant from outside sources of supply. This "raw" material may be bars or sheets or rolls of metal, sheets or rolls of paper or cloth, boxes, barrels or tins of granular or liquid materials, boards or planks of wood, or any of a thousand similar items. Adequate stocks of such materials must be kept on hand to permit production to flow uninterruptedly. And, at the same time, tools and extra machine parts must be kept in stock, ready at an instant's notice to be brought into play to keep the production flow running smoothly. All such items of stock, prior to actual use, may be

termed Class A storage; of an essential and indispensable nature.

A second class of storage facilities is generally of an even more temporary nature; occurring during the processes of production usually because management finds it economical to produce a larger quantity of a par-

ticular part at one time than may be required by the immediate needs of the assembly operations. The "overs" must then be temporarily stored until needed. Engine blocks may be cast and held for "curing" until they may be machined; motor laminations may be notched in large quantities in ad-

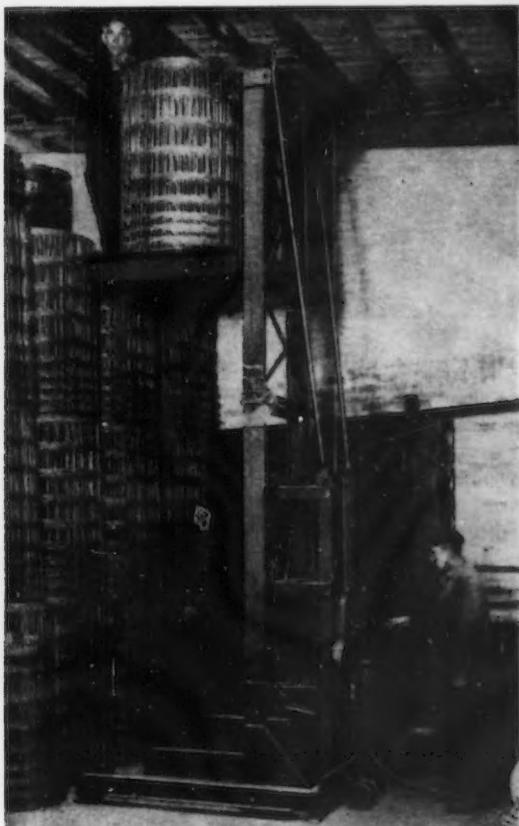


FIG. 3—Barrett-Cravens portable hand-powered elevator of the non-telescoping type, as used in stacking rolls of fence wire four high from floor to ceiling.

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AT LEFT
FIG. 3—Barrett-Cravens portable hand-powered elevator of the non-telescoping type, as used in stacking rolls of fence wire four high from floor to ceiling.



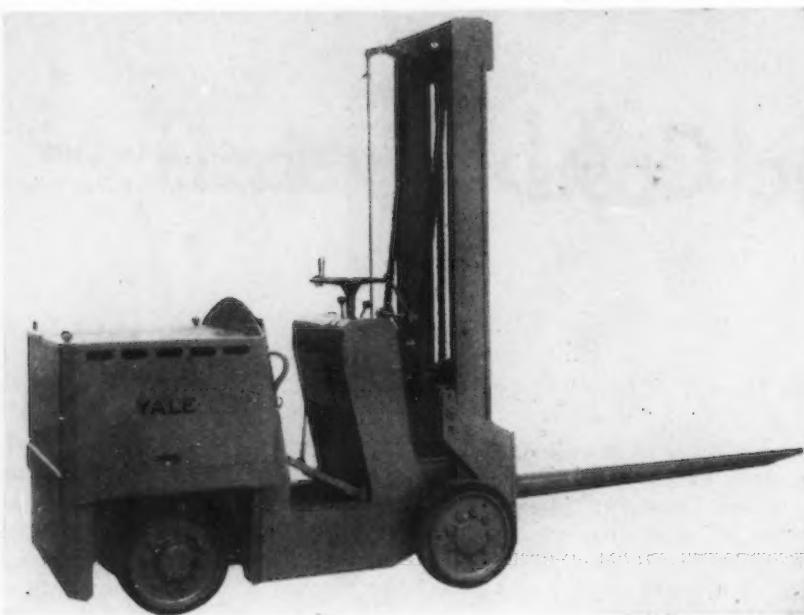
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FIG. 4—Clark Truc-tier gas-engine powered industrial truck which picks up two-ton loads, tilts them, carries them and stacks them to heights up to 8 ft.

• • •

vance of motor assembling; sub-assemblies of various parts may be made ahead, and kept in readiness for the final assembly of various types, sizes and models of product as the need arises; special nuts, bolts, screws and fasteners of one kind or another may frequently be produced in greater quantities than immediate needs dictate, at a saving in production costs over piece-meal production; or a hundred other like demands may require the temporary storage of partly-finished goods. These may be termed Class B storage requirements.

And, finally, it is seldom possible for any plant management to so adjust its production schedules that finished



ABOVE

FIG. 5—Yale non-tilting elevating ram truck, with articulated frame. Ram capacity 180,000 in.-lb. Maximum load, 4,000 lb.

• • •

AT RIGHT

FIG. 6—Baker-Rau-lang 5-ton capacity Hy-Lift tiering truck, for lifts up to 106 in. above floor level. Trailing axle is articulated, for rough travel.



goods may always be turned out at just the precise moments that shipments may be made away from the plant. No manufacturing plant should consciously be made into a storage warehouse of finished product, but, be it large or small, some elastic cushioning of temporary storage must be provided between the point of the finishing of the product and the actual shipment away from the plant. This type of storage may be termed Class C.

Storage Economics

All storage facilities within the manufacturing plant, whether of Class A, B or C requirements, should be "live"; that is, so arranged that materials, parts or goods held therein are kept there only for temporary periods, and not stored permanently. It is essential that they be so arranged and managed that any and all goods are at all times accessible, and may be removed at a moment's notice. Flexibility should be the keynote of live storage handling, for it cannot be denied that storage of any kind, for whatsoever purpose, is a non-productive load. Under no conditions (except possibly that of a rapidly rising market when inventories presumably appreciate in value) can goods held in storage do their share of earning a manufacturing profit. While they are being held they are inactive, and from three points of view cost money: (1) interest on the investment runs on, (2) the rate of possible production turn-over is decreased, and (3) the space used for actual storage must be paid for.

Since, under the particular conditions of plant management obtaining

in any given case items (1) and (2) above may be conceded as unavoidable losses, the chief possibilities of actual economic savings lie in more effective methods of making use of actual storage space. This is the angle of the subject which will be developed here, as a factor of the general subject of materials handling economics.

"Rental" of storage space must be considered a debit item in plant accounting whether the plant is occupying rented quarters, or is owned by the manufacturer. In the first case, it may readily be seen that the rental value of the storage space may be esti-

mated as the proportion of the total plant rental that the storage space bears to the total plant space used. In the latter case, however, rental value must be estimated as that value which the space used for storage might have if it were used for production operations. In either case, since a definite cost item must be debited on the grounds that such space is *non-productive*, it is essential that such space be limited in area to that which is absolutely necessary to meet the real needs of the situation.

But the space which is "absolutely necessary" may be spread out over a large area or compactly arranged to

utilize three dimensions effectively. And this latter method is the real contribution which modern tiering and stacking equipment has made to the technique of economical production management.

The New Method

The new method consists essentially in the use of handling equipment which makes possible the use of all the storage space in any area from the floor to the ceiling; or in other words, utilizes the entire cubical contents of the storage space provided. The principal elements of such equip-

ment consist of trucks (either hand or power-driven) so designed as to permit the easy transfer of loads to and from the storage room, and in that room, elevating mechanisms so designed as to permit the easy lifting of the loads to economical stacking or tiering heights as well as the reverse operation of taking the loads from the stacks or tiers to the floor level.

In general, two methods of stacking are used. In the case of small items of load (nuts, bolts, screws, odd-shaped small parts, or materials or parts which might suffer damage if piled on one another, or kegs, barrels or drums best stored on their sides)

structural shapes, coils, rolls, reels, or other similar self-containing packages, they are usually stacked or tiered directly one above another, without the use of any rack supports. (Sometimes small quantities of many different sizes of bars, rods, pipe, etc., are best stored in separate racks or long bins.)

In either case, two equipment elements are required; used as separate pieces of handling apparatus, or combined into one handling unit. The first element is a mobile truck with a low load-lifting mechanism; the second is a high-lift, or load-elevating mechanism. To these elements may be added special load-grabbing equipment, to pick up unusual types of

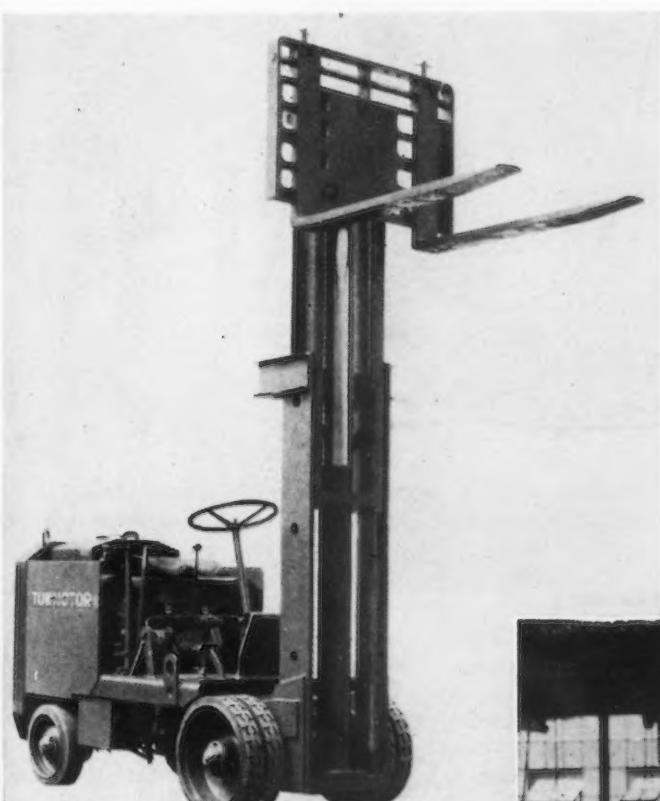
loads. Whether the equipment used is a double-unit combination, or a single-unit, dual purpose mechanism, it is readily seen that what is really required to operate the new "cubical contents" method of storage successfully is a completely self-contained, high-lift handling device, capable of both lifting and shifting.

Where the skid-box method is used, the mechanism is a lift truck and a portable elevator; either in the form of two separate pieces of equipment, or a single unit of dual-purpose characteristics. The lift truck may be of the platform or the jack-lift type, or it may be a fork truck.

Where skid-boxes are not used, the single-unit mechanism is most common in the form of a fork-truck, a ram-truck, a scoop-truck, or a crane-truck with various types of hooks, slings or grabs as the loads to be handled may require.

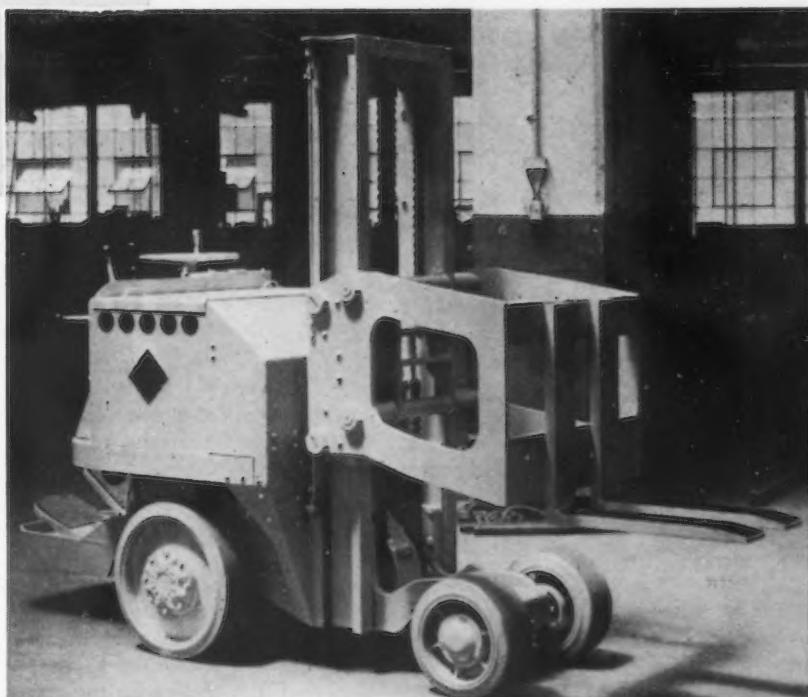
Equipment

The simplest and least costly investment in equipment requires the largest expenditure of time and manual effort to operate. This is the hand-lift truck, portable elevator combination. Much greater equipment investment (in completely self-contained power-driven single units) operates more quickly



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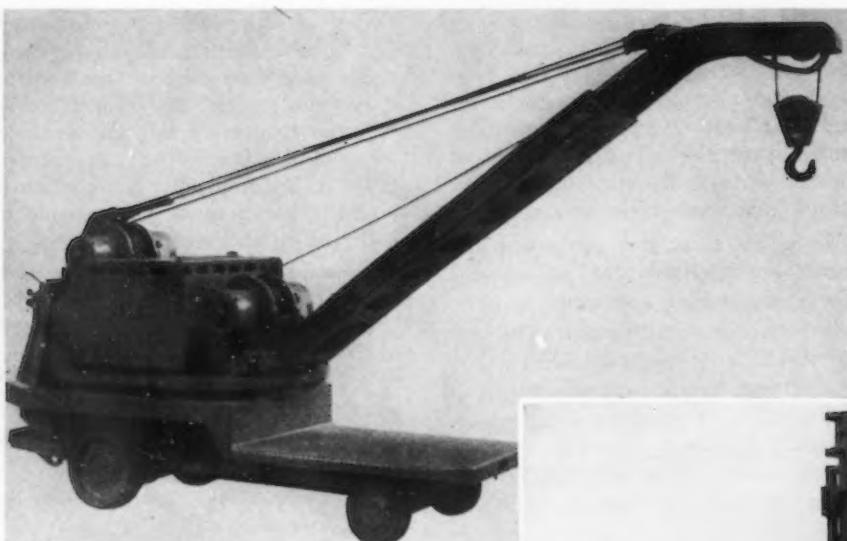
FIG. 7—Townmotor gas-engine powered fork-lift truck with telescoping mast. The forks are adapted to carry pallets, skids, or heavy large objects direct.



BETWEEN

FIG. 8—E'well-Parker fork-lift truck of unique design. The fork supports drop over the front wheels, permitting the elevating framework to be carried back.

open racks, usually made of metal are used. On these racks kegs, barrels or drums may be stored directly; otherwise the parts are placed in skid-boxes and the skid-boxes placed in compartments of the racks. In the case of boxed, crated, baled, or otherwise substantially packed goods, or of materials or parts or product of large regular shapes, such as rods, bars,



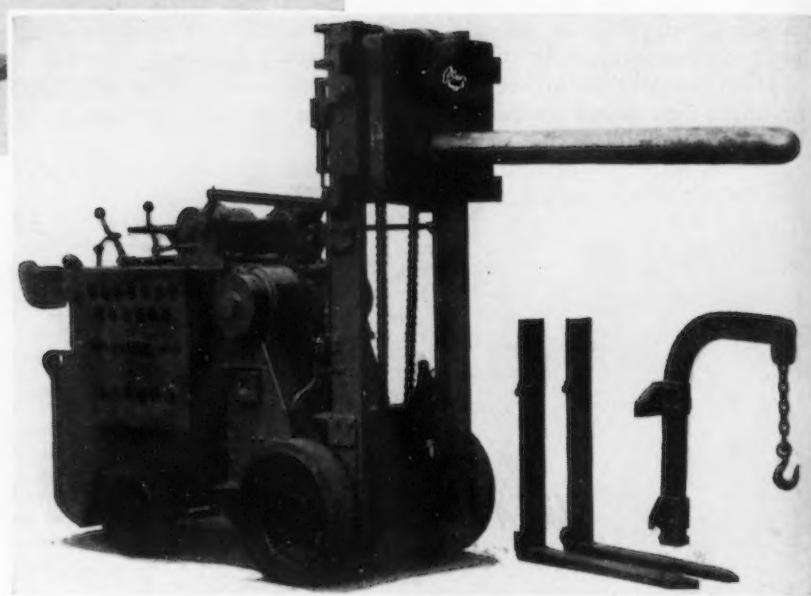
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FIG. 9—Yale four-motored crane truck with telescoping boom. Capacity 3,000 lb. at 8 ft. outreach. Maximum boom outreach, 19 ft.

• • •

BELOW

FIG. 10—Automatic Transportation medium lift tiering truck with three interchangeable fixtures; forks, ram and curved boom with chain and hook.



and with a minimum of manual effort. The most economic arrangement of equipment for any particular case requires a careful balancing of the two factors of investment and operating costs. Generally speaking, when handling is light and infrequent, the hand equipment serves admirably; when handling is heavy and continuous, the power-driven units are best. Heavy loads, infrequently handled, and light loads handled continuously, are the border-line cases which need the most careful study of costs in order to make a wise choice of equipment.

Hand-lift trucks are available in a wide variety of types and sizes. The principles of skid-lift truck handling were treated briefly in the issue of March 18, 1937, in an article entitled "The Humble but Useful Brothers-in-Arms." Whether the hand-lift truck be mechanically or hydraulically powered, the lifting action is accomplished by "pumping" the truck handle back and forth, to elevate the truck platform a few inches in order to lift the skid-platform clear from the floor so that it may be trucked to the storage room. Here it is necessary to transfer the load to a high lift, or elevating platform mechanism, to raise it high enough to be moved manually onto a rack or on top of a tier of other goods. This elevating mechanism is usually telescopic in nature; that is, the platform rises on two or more sections of lift mechanism which telescope into each other. This lifting mechanism may be manually or electrically powered.

With single-unit, dual-purpose equipment, the electric, gas-electric, or gasoline engine driven industrial truck is the basic shifting element, onto which is superimposed a high-lift elevating mechanism, usually telescopic.

Reference to the accompanying illustrations will make these various points clear.

The Illustrations

Fig. 1 shows a Revolvator Co. high-lift elevating mechanism with exceptionally low floor clearance in the lowered-platform position. The top of the steel plate platform is only 2½ in. above floor level. The hinged plate is used when live skids are rolled onto the platform, or when barrels or drums are placed on it directly. For ordinary skid or pallet lifting, the hinged plate may be folded over on top of the platform, out of the way. By an electric hoist, served with an extension cable, the platform may be lifted to within a few inches of the top of the hoisting framework.

Fig. 2 illustrates a Lewis-Shepard electric worm-drive stacker as used in stacking bulky rolls of paper on end from floor to ceiling, four high. This is a very substantial portable elevator of the telescoping type, built in various sizes and capacities to take from 350 lb. to 10,000 lb. Lighter models may also be had with hand-crank in-

stead of electric motor drive, and the base may be so constructed that the entire upper framework will turn from side to side.

A very handy hand-powered portable elevator is shown in Fig. 3. This equipment is made by Barrett-Cravens. When not in use the tie-rods may be unfastened, and the upper half of the framework folded down upon the lower half, permitting the equipment to be stored away in small space when not in use. This elevator is shown stacking rolls of fence wire four high in the plant of a wire manufacturer, thus conserving valuable floor space.

The Clark Tructier shown in Fig. 4 is a completely self-contained stacking unit of the telescoping frame type. Powered with a 6-cylinder gasoline engine, it picks up any 2-ton load having as much as 2 in. underclearance, tilts it back, carries it at speeds of from one to six miles an hour, elevates it, tilts it forward and tiers it as high as 8 ft. above floor level.

The Yale electric truck illustrated in Fig. 5 has a special elevating ram of 180,000 in.-lb. capacity. It has a

non-tilting lift. The truck frame is of the articulating type, permitting the truck to carry loads on the ram up to a maximum of 4000 lb. over uneven floor surfaces without danger of overturning. Designed and built for a large steel company, it is used for handling strip steel in coils in and out of storage, and during production.

In Fig. 6 there is illustrated a new Baker-Raulang 5-ton capacity Hy-Lift tiering truck, for lifts up to 106 in. above floor level. This truck, with its platform type of lift, is particularly adapted to the handling of skids and skid-boxes. Hoisting is accomplished by two double strand alloy steel hoist-

rangement, with the load balanced between the wheels, instead of in front of the forward wheels. This is not a telescoping lift, therefore the maximum lift is only of medium height. It will be interesting to see how this radically new design works out, and whether it will later be adapted to a telescoping high-lift mechanism.

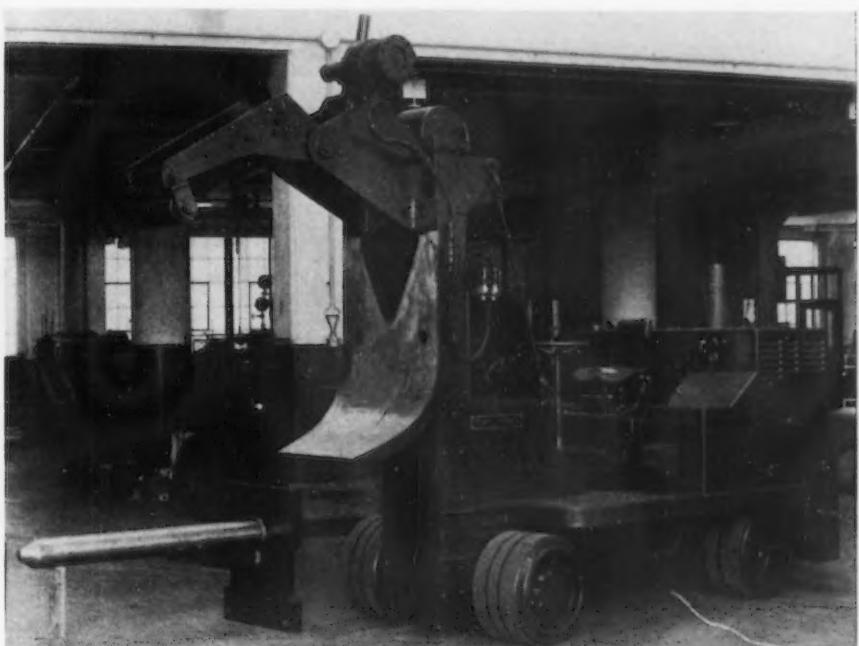
Fig. 9 shows a Yale crane truck of somewhat remarkable versatility. The crane boom is a telescoping affair with a maximum extension of 19 ft., at which point the hook may be lifted 20 ft. above floor level. At an outreach of 8 ft., the capacity is 3000 lb. The unit has four separate motors

with independent controls, for driving the truck, for raising or lowering the boom, for slewing the boom through a 270 deg. arc, and for hoisting the load. All four movements may be carried on simultaneously. All motor controls are push buttons. Maximum maneuverability is provided with maximum safety. Aside from its evident adaptability for tiering and stacking, this truck has a wide range of usefulness on such jobs as the loading and unloading of railroad cars, lifting and transporting sheet metal, pipe, bars and rods, handling scrap, and moving and setting heavy machinery.

In Fig. 10 a medium lift Automatic truck is shown with three interchangeable handling fixtures. The ram is adapted for coil and roll handling, the forks for picking up pallet or skid loads, and the curved boom with chain and hook for handling loads in slings or buckets with handles. The various fixtures can be interchanged quickly, as they all have projecting flanges which fit over appropriate bars or into sockets on the hoisting unit block.

Elwell-Parker has just brought out the rhinoceros-mouthed unit shown in Fig. 11, especially designed to handle rolls of material. The fixed scoop plate runs down flush with the floor, and edges partly under the roll. Then the roller-tipped upper jaw folds down over the top of the roll, enclosing it in a snug embrace, on the scoop, without damage. Finally the elevating mechanism picks up the roll to a safe traveling height, transfers it to a new

(CONTINUED ON PAGE 52)



ing chains, each with an ultimate strength of 34,000 lb. The hoist controller operates through a magnetic blow-out, mill-type contractor, which takes all arcing from the controller itself. The trailing axle is of tandem construction, articulated, and with the duplex compensation of the power axle, permits safe travel over uneven floors.

A Towmotor gasoline-engined lift truck with telescoping mast which permits it to pass under restricted headroom in the lowered position, is shown in Fig. 7. The special fork mechanism permits the pick-up of skids, pallets or large heavy shapes direct.

Fig 8 is a new Elwell-Parker fork truck of unique design. The open box-like structure carrying the forks drops down over the trailing wheels, permitting the elevating mechanism framework to be stepped amidships. This makes an extremely compact ar-

ABOVE

FIG. 11—Elwell-Parker roll-grab scoop truck, with interchangeable ram. Designed to handle rolls of material from floor level to tiering level without damage.

• • •

AT RIGHT

FIG. 12—Mercury telescoping, tilting, fork-lift truck, adaptable to maximum lifts of 144 in. and maximum capacity of 10,000 lb. on 36-in. forks.



Alloy Steels in Bucket

Design and Operation

ALLOY steels are playing an important part in the development of an increasingly large number of industrial products and types of equipment. Their present wide application has been an influencing factor in the creation of new designs as well as in redesigning, in order to more nearly utilize the maximum benefits from these high strength light-weight materials.

One of the newer fields in which these alloys are finding application, and where design has been a factor, is in the construction of light-weight clamshell buckets.

Authorities on the subject would hardly agree that the use of alloy steels has provided the complete and final answer to all the problems encountered in the construction of buckets of the light-weight types, and many may disagree as to the fitness of the light-weight bucket in some fields. However, there does exist sufficient evidence to justify an affirmative conclusion as to the trend, providing certain qualifications, which will be described more fully, are given due attention.

In view of what may be considered a trend toward the acceptance of light-weight alloy buckets, analysis of the subject may be helpful in considering the degree of economy, as well as certain practical aspects involved in their use.

Digging Ability a Factor

Records show that in some of the material handling fields, performance has been stepped up as much as 50 per cent with existing crane and hoist facilities. Nevertheless, to fully realize the limitations as well as the advantages of this type of equipment, it becomes necessary to take into account and to be most critical of those

characteristics in design which influence digging ability.

Reducing bucket weight without sacrificing strength is a worthy achievement, but it is equally important to preserve adequate digging qualities, bearing in mind that in many cases the prime function of bucket weight is penetrating force. The dipper of a power shovel can be made as light in weight as is consistent with strength requirements, and still dig heaping loads because it is crowded into its cut by a controlled force from without. The same can be said for a dragline bucket because it is pulled through the material until it is loaded.

Clamshell Buckets

The operation of a clamshell bucket is not so simple. The force causing its penetration into the material is bucket weight (gravity). Reduction in bucket weight must, therefore, be considered as a reduction in digging force unless practical means are adopted to compensate for weight reduction. It is for this reason that the extensive use of alloy steels for clamshell buckets must achieve not only a saving in dead weight on the one hand, but it must lead on the other hand to a more common understanding of fundamentals which influence "digging ability." The application of these fundamentals in bucket design must be accentuated to enhance the practicability of alloy steel construction.

It is a matter of common observation that two buckets of equal weight and size may vary as much as 20 per cent in performance. The principal reason for such a contrast is that one bucket has the design advantage of greater working force. At this point a few conclusions can be summarized:

1—"Digging power" is a variable dependent upon design.

2—"Weight" is a variable determined by strength requirements and



by the resistance to penetration offered by the material to be dug.

3—A practical balance must exist in the relation between these two variables, thus calling for experienced and skillful design.

Pay Load Increased in Handling Coal

The handling of coal offers an example of the possibilities that may be expected by the use of alloy steel. Many grades of coal are comparatively easy to dig with the result that buckets of ordinary weight load to

overflowing. Light-weight alloy buckets of ordinary design will dig a moderately good load. Light-weight alloy buckets with digging characteristics properly accentuated in the design will load to overflowing. This achievement is illustrated by Fig. 1, showing a two-line type light-weight alloy steel coal digging bucket, which in service is handling an increased pay load of about 30 per cent more nut and slack; 25 per cent more run-of-mine; 40 per cent more buckwheat; and 50 per cent more coke.

This rate of increase in pay load was made possible without increasing the total load on the hoist by the use of light-weight alloys in construction and by accentuated digging qualities resulting from improved design. Fig. 2 illustrates a coal handling bucket of the four-line type constructed throughout from alloy steels. This bucket, operated on an existing gantry crane, reduced boat unloading time about 30

much from the effective downward force at the cutting lip. On this premise it becomes evident that discrimination in design must advance hand in hand with light-weight alloy steel construction.

By E. L. HARRINGTON

*Chief Engineer, Bucket Department,
Blaw-Knox Co., Pittsburgh*

A broad view of this subject must include reference to what may be termed "heavy-duty requirements." Heavy materials weighing from 100 to 350 lb. per cubic foot, often with large lumps predominating, are commonly handled with grab buckets. Many such materials are very hard to dig, and they resist penetration to

• • •

AT LEFT

FIG. 1—High-speed two-line tower bucket, alloy steel throughout.

BELOW

FIG. 2—Four-rope bucket of light weight alloy steel construction for gantry sheave trolley operation.

such an extent that much more bucket weight is needed for efficient performance than is required for strength. As an example, a heavy duty digging bucket weighing 8200 lb. in handling ferromanganese will dig approximate loads of only 10 cu. ft. (3500 lb.) per grab.

Wide Range of Service Requirements

Bucket weight as an "operating force" may exceed weight as "required for strength" by 10 per cent or 100 per cent, depending upon the character of material to be handled. Fig. 3 illustrates a 32,000-lb. bucket with curved bottom scoops, fitted with dipper type teeth, designed for handling 5 cu. yd. loads of quarry stone, boulders, etc. Fig. 4 illustrates a bucket of the same capacity weighing only 6000 lb., designed to handle wood chips.

This contrast will indicate something of the range in service requirements encountered between the extremes of handling snow, sawdust, or sugar beets on the one hand, and quarry rock, open-hearth slag, or ferromanganese on the other hand.

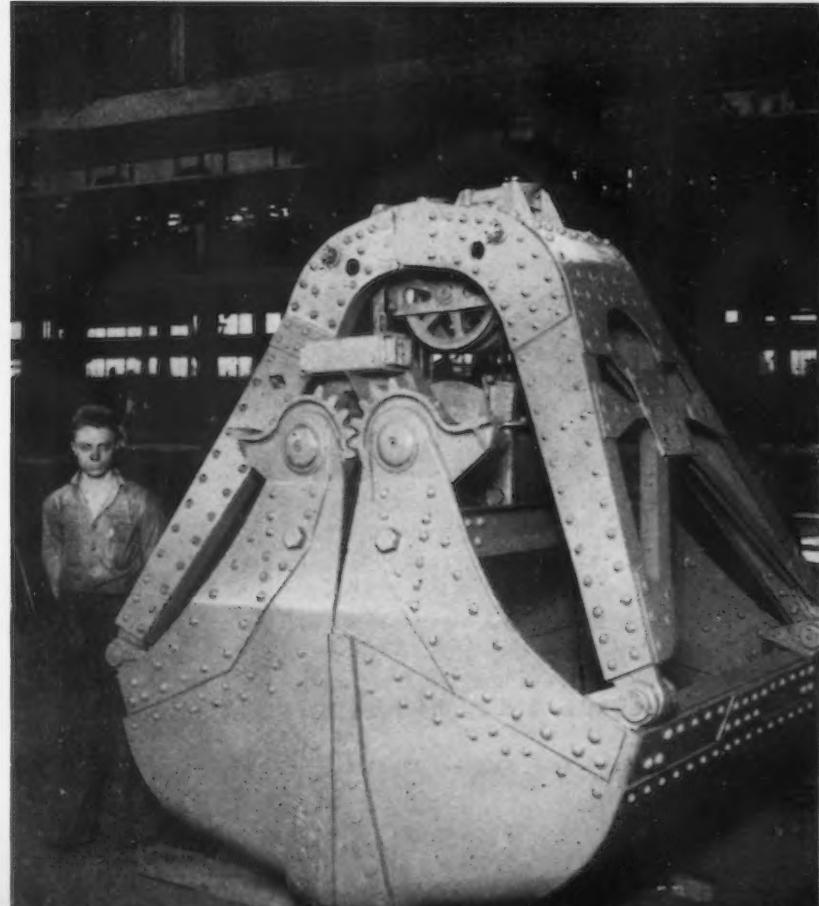
In dealing with this variable factor of weight it becomes evident that the economies to be realized from the use of high strength alloy steels vary according to the purpose of their application in bucket design. The following conclusions may serve as a helpful guide in determining when

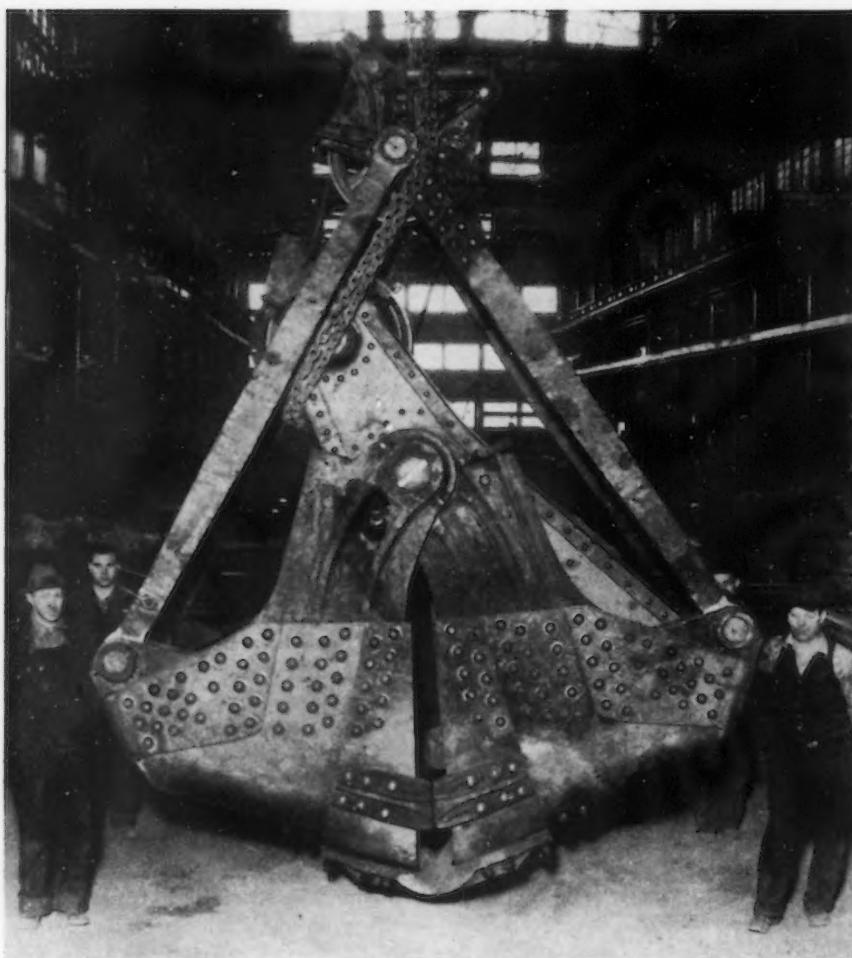


per cent, obtaining a ratio of approximately 1:1 between pay load and dead load.

Bucket Weight vs. Penetrating Force

It has been previously stated that penetrating force is derived from bucket weight. The extent to which bucket weight is effective as a penetrating force depends entirely upon those elements in design which influence the "hoisting effort" exerted for closing. This effort, being an external vertical force, detracts just that





ABOVE

FIG. 3—Heavy-duty two-line dredging bucket constructed with alloys to withstand breaking strength of $1\frac{1}{4}$ -in. cable.

• • •

and where the advantages of alloy steels can best be utilized in clamshell bucket construction, whether applied to light-duty or heavy-duty requirements.

a—The greatest value to be derived from the use of high strength alloy steels is found in their application to buckets which require much less weight for digging than commonly employed for normal strength requirements.

b—High strength alloys may also be used to advantage in cases where bucket weight may be reduced by virtue of skillful design, in which superior digging qualities are obtained with minimum weight.

c—Alloy steels are often used to advantage for pins and shafting in heavy weight as well as light-weight

buckets to obtain maximum strength as well as good wearing qualities.

d—Cutting lips for all buckets should be made from a special alloy steel, heat treated to develop wear resisting properties as well as maximum strength.

e—In the presence of certain corrosive materials or fumes, the use of special alloys aids in delaying corrosion.

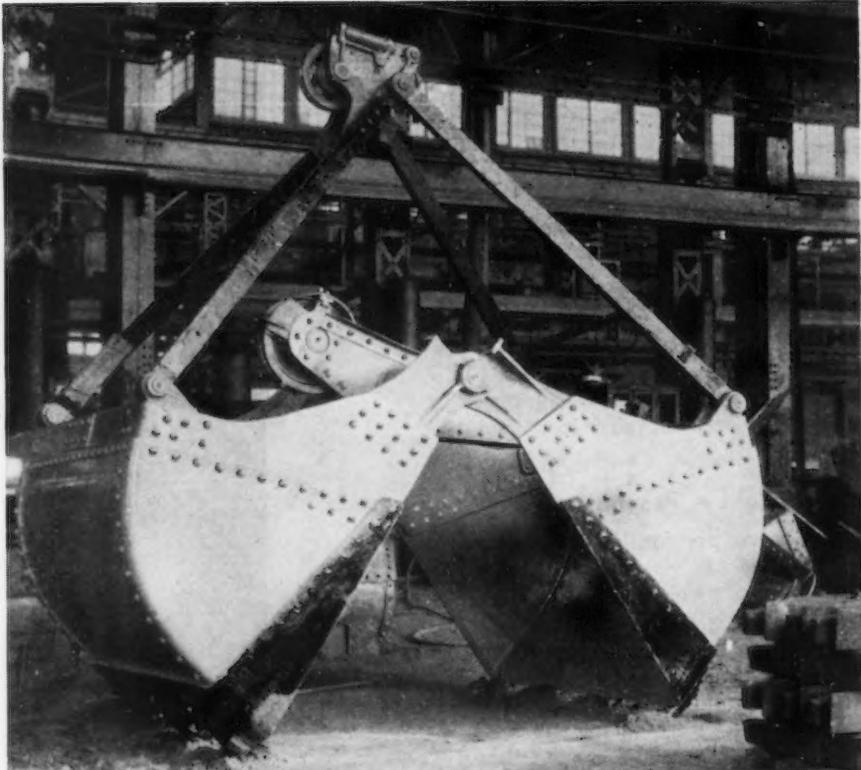
Wide Use of Alloys

The wide use of alloy steels in this field holds economically sound possibilities. However, these possibilities will be developed* to their fullest extent only when design is such that it takes into account the elements needed to insure maximum performance with less weight. Enough progress has been made to presage a far-reaching influence on bucket design generally, and to establish a comprehensive basis on which the use of high strength alloy steels for bucket construction may be used.

• • •

BELLOW

FIG. 4—Light weight large capacity two-line bucket for handling wood chips.



New Uses for Old Grinding Wheels*

By W. H. SALMON

In many grinding rooms stacks of old grinding wheels have been hoarded for years in the hope that some use might be found for them, or the abrasive-wheel manufacturer persuaded to take them back to be applied against the cost of new wheels. The difficulty of removing the bond from the surface of the grains and the danger of an unsatisfactory re-bonding of grinding wheels operated at high speeds have prevented the wheel manufacturer from using this potential source of abrasive grit. There are, however, numerous foundry applications in which absolute cleanliness of grain surface is not so essential.

Table I shows the three general classes of abrasive scrap available. The first class consists of abrasive wheels bonded with organic mixtures such as rubber, bakelite or resinoid compounds. The wheels are tough and are used for heavy duty, but the removal of the bond can be achieved by burning it off the grains at a red heat, after which the wheel can be crumbled in the fingers to recover the individual grains of abrasive.

The second type of scrap is the silicate or clay-bonded wheels, which are brittle and have to be crushed. It is more difficult to obtain the individual grains, but for foundry purposes the crushed material can be graded into suitable grain sizes.

Lastly, there is the mixture of abrasive and metal dust which is collected from dust catchers. Such material contains about 30 per cent of finely divided abrasive, which can be sep-

WHEN a grinding wheel has been scrapped it seemingly has outlived its usefulness. However, in England old wheels are broken up and the abrasive grit reclaimed and bonded with clay, cement or oil and used in foundry practice as a mold dressing, furnace lining or chilling material. The very interesting results obtained are reviewed herein.

arated from the iron and steel dust by means of magnetic separating units. It may be of interest to note that even the metal dust from non-magnetic steel, such as manganese steel, becomes sufficiently magnetic after grinding to enable the abrasive dust to be collected free from metal.

The abrasive grits used in the manufacture of grinding wheels fall into two classes: Silicon carbide wheels for the low tensile metals such as cast iron and non-ferrous metals; and emery or high alumina wheels used for higher tensile metals such as steel.

Silicon Carbide Scrap

From the foundry point of view, the silicon carbide or carborundum scrap is more interesting on account of its high thermal conductivity compared with sand, which allows it to be used to make moldable chills for heavy sections. It is crushed and bonded with clay or cement, or may be used without crushing by building up chill sections with pieces of scrap grinding wheels and Carborundum bricks. In

order to make special collapsible chills for use in situations where solid metal chills could not be permitted, the scrap is sieved to the grading or core sand and bonded with suitable proportions of clay, dextrine and core oil. The surface of the core or chill is painted with graphite to maintain the good heat conductivity and to prevent fusion of the silicon carbide with the metal. Such internal chill cores have been found useful in casting certain special steels of high shrinkage.

The approximate thermal conductivity of various materials which have been used as chills is given in table II. The figures in the last column show the relative thermal conductivity assuming silica brick as unity, and it will be seen that cast iron is 53 times, silicon carbide 11 times, and alumina or emery 4 times as conductive as silica brick. It is interesting to note in the case of the silicon carbide bricks that the thermal conductivity falls rapidly as the percentage of silicon carbide is reduced from 90 to 49 per cent.

Inspections made on a fractured cast iron test plate 5 in. square and $\frac{5}{8}$ in. thick, cast on chills made of copper, cast iron, silicon carbide, emery, and silica sand, showed the chilling effectiveness of various materials used to be as follows: Copper chill, 1½ in. depth; cast iron chill, 1 in. depth; emery chill, $\frac{5}{8}$ in. depth, and silica sand, no chill whatsoever.

In this test the volume of the chilling material was constant; but the weight varied according to the density of the material. The copper and cast iron blocks were cast solid, and their densities were 535 and 480 lb. per cu. ft. respectively.

The other chills were molded from

*Abstract of a paper awarded first prize in the Short-Paper Competition held under the auspices of the Sheffield chapter of the Institute of British Foundrymen, and reproduced here through courtesy of the *Foundry Trade Journal*.

TABLE I
Classes and Types of Abrasive Scrap Commonly Available

Classes of Abrasive Scrap	
(1) Organically-bonded wheels.	Bakelite or resinoid bond burned off at a red heat.
(2) Silicate or clay bonded.	Crushed to selected grading.
(3) Dust from grinding-machine dust catchers.	Magnetically separated.
Types of Abrasive Grit	
(1) Silicon carbide.	Cast iron and non-ferrous.
(2) Emery (alumina).	Steel.

silicon carbide, emery and silica sand bonded with 2 per cent Bentonite, 2 per cent dextrine, and 2 per cent core oil. The pieces were baked at a temperature of 390 deg. F. Naturally these chills were not so heavy as the

but also on the weight of the chill, it will be seen that silicon carbide gave a satisfactory chill, although the weight of the chill employed was less than one-quarter that of the cast iron chill.

TABLE II
Comparison of the Relative Thermal Conductivity of Various Materials

Chilling Material	Thermal Conductivity c.g.s. Units	Temperature Range Deg. C	Relative Thermal Conductivity (Silica Brick as Unity)
Copper	0.8580	100 to 837	408.0
Graphite	0.2840	0 to 1000	135.0
Cast iron	0.1110	100	53.0
Carborundum brick:			
90 per cent SiC	0.0239	1100	11.4
77 per cent SiC	0.0191	1100	11.0
57 per cent SiC	0.0108	1100	5.2
49 per cent SiC	0.0093	1100	4.4
Alundum (alumina)	0.0084	0 to 1000	4.0
81 per cent alumina brick...	0.0050	1100	2.4
70 per cent alumina brick...	0.0023	1100	1.1
Silica brick	0.0021	1000	1.0

metal chills. The silicon carbide chill had an apparent density of 100 lb. per cu. ft. after baking, while the emery or high alumina chill was slightly heavier at 145 lb. per cu. ft. As the intensity of chilling depends not only on the thermal conductivity

It has been found that the weight of the silicon carbide chill is not so critical as it is when iron chills are used. For instance, if the chills are too light there is less danger of the metal fusing on to the chill. On the other hand, a heavy iron chill is likely

TABLE III
Applications for Scrap Abrasives

Type of Foundry	Abrasive Grit	Applications
Cast iron	Silicon carbide (carborundum)	(1) Chills bonded with clay or cement. (2) Wearing faces impregnated with silicon carbide grains. (3) Coatings for cast iron welding rods. (4) Rammed furnace linings, etc.
Non-ferrous	Silicon carbide (carborundum)	(5) Mold dressing to replace silica flour. (6) Shank linings. (7) Steel molding compositions. (8) Heating element beds for electric resistance furnaces. (9) Rammed linings for high frequency furnaces.
Steel	Emery (alumina)	(10) Rubbing down oil-sand cores.
General	Emery (alumina)	

to give cold laps, but this tendency is not so evident when silicon carbide chills are employed.

The silicon carbide scrap can be used in various forms. Where permanent chills are required, the grit is bonded with clay, molded to the desired shape and fired. If a more collapsible chill is necessary, less clay is used, and the strength augmented by core oil additions which burn out after casting and enable the cores to be shaken out as easily as the usual silica oil sand cores.

In table III are given some further applications of discarded abrasive materials. In the second application for foundry purposes, silicon carbide is used with a fusible bond, such as sodium silicate or phosphoric acid, so that a hard facing of the material is cast into the wearing faces of cast iron or steel articles in order to extend the working life, or to give extra resistance to local abrasion, as for example, in the edges of stair treads.

Welding Rod Coating

In repairing iron castings, a coated welding rod is frequently used which introduces silicon into the deposited weld metal in order to control graphitization and prevent the formation of hard spots. This objective may be attained by using silicon carbide as one of the ingredients of the coating used on the welding rods. For iron foundries making their own welding rods, scrap grinding wheels are a cheap source of the necessary silicon carbide.

The abrasive wheels in brass and non-ferrous foundries are often of the silicon-carbide type, so that the reclaimed scrap could be used as a rammed lining for the melting furnaces and air settling cements made from the same base could be used for patching such linings, or repairing the fire brick faces in other types of furnaces.

In steel foundries there are very few scrap silicon carbide wheels available, because practically all the wheels used are of the emery or high alumina type. While moldable chills have been made of emery scrap, the thermal conductivity was found to be lower than silicon carbide, and it was expected and confirmed in steel foundry practice that emery chills were not quite so effective as chills made from silicon carbide.

However, as the refractoriness of high alumina material is better than highly siliceous mixtures, scrap emery wheels and emery dust recovered from

(CONTINUED ON PAGE 52)

New Aids for Arc, Gas and Spot Welding

By FRANK J. OLIVER
Associate Editor, The Iron Age

RECENT developments in equipment for the welding shop include an improved type of bending roll, new features and a new size of welding generator set, a novel design in an electrode holder, an electric preheater for alloy pipe welding, a new form of torch cutting

machine for pipe work, improvements in gas regulators, gas hose and acetylene generators, and a new series of spot welders. Some developments in solders and fluxes are also reviewed. Equipment related to industrial drives and material handling will be reviewed next week.

SINCE bending rolls are such a necessary adjunct to a welding shop fabricating machine elements out of rolled steel shapes as well as plates, we call attention in this review to the improved No. 3 horizontal bending rolls made by the Buffalo Forge Co. Changes have been made to achieve a more compact and trouble free drive. As shown in the illustration, the drive unit is in a pit below the floor level and consists of a direct-connected motor, built-in Jones worm gear reducer and in the same housing a Maag spur gear reducer. All bearings are Timken and a built-in pump circulates oil over both gears and bearings. Grease-sealed Morse chain flexible couplings are used at both input and output shafts. The coupling on the vertical output shaft is connected directly to

the roll pinion shaft and cushions the impact during reversal of the rolls.

Power adjustment of the roll may be had optionally by means of a compact geared arrangement with a reversible motor drive.

Welding Generator Sets

Simplified arc welders redesigned to operate magnetically instead of manually, have been announced by the Hobart Brothers Co., Troy, Ohio. Complete overload and under-voltage protection is provided. When the welding load is such as to require the full rated horsepower of the motor, the operator "flips" a small toggle switch to "high" position and presses the starter button. Motor then starts under reduced voltage with about one-third the starting current usually

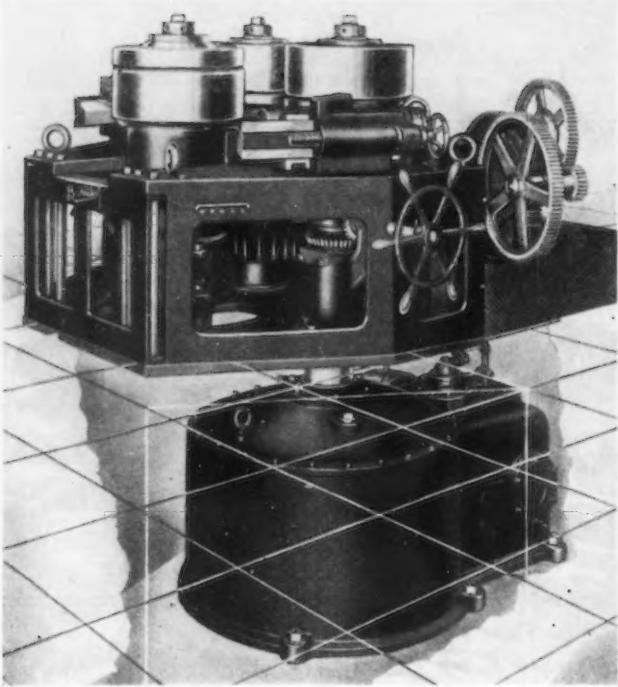
drawn. As soon as the machine comes up to speed, the switch automatically changes over to the normal, full-load running position.

When one-half the rated horsepower of the machine is sufficient for the job at hand, the operator flips the toggle switch to the "low" position; then, when the starter button is pressed, the machine starts and runs without changing over to the full-load position.

A "Junior Model" 200-amp. gasoline engine driven arc welder has also been announced by Hobart Brothers to meet the need for a unit of smaller size and lighter weight than the larger, 6-cylinder engine powered machines. It is a completely equipped outfit on steel skids, with canopy enclosure and hinged side panels that can be padlocked. Equipment includes electric self-starter, battery ignition with generator, built-in fuel pump, air filter, fuel filter, variable-speed governor, sectional steel radiator, built-in fuel tank and other engine equipment. The welding generator is provided with Hobart's remote control, polarity switch, built-in exciter, dual control and other features exactly the same as in larger outfits.

Electrode Holder

A novel electrode holder has been developed by a California firm, the



Delong-Cramer Co., of Southgate. It has replaceable jaws made of heat-treated spring steel with oddly curved ends and serrated faces to keep the electrodes from slipping. Rods may be quickly inserted and held in any position. Handle is air cooled and has a fibre heat shield. The holder comes in three sizes to take rods from $1/16$ to $3/8$ in. diameter. Combination cable connections permit soldering or clamping or both. Well balanced and light in weight, the largest size weighs only 22 oz.

Pipe Preheater for Welding

As a supplement to its induction stress reliever used on high-tempera-

ture, high-pressure welded joints, the *Detroit Electric Furnace Co.*, of Detroit, has developed a rapid and flexible electric pre-heater for use on alloy pipes before welding. Any temperature up to 600 deg. F. can be maintained during the welding operation for a distance

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AT LEFT

THE main roll drive of the No. 3 Buffalo horizontal bending roll has been completely redesigned to make it more compact and trouble free.

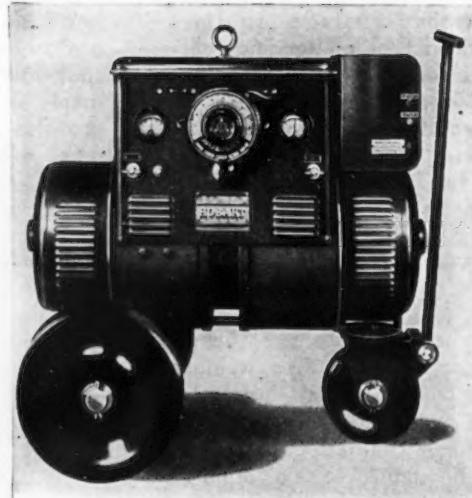
AT RIGHT

THE jaws of this Delong-Cramer electrode holder are made of heat-treated spring steel.

• • •

BETWEEN

DETROIT Electric Furnace Co.'s alloy pipe preheater consists of adjustable heating elements in a connecting linkage protected by insulating blankets.



ABOVE

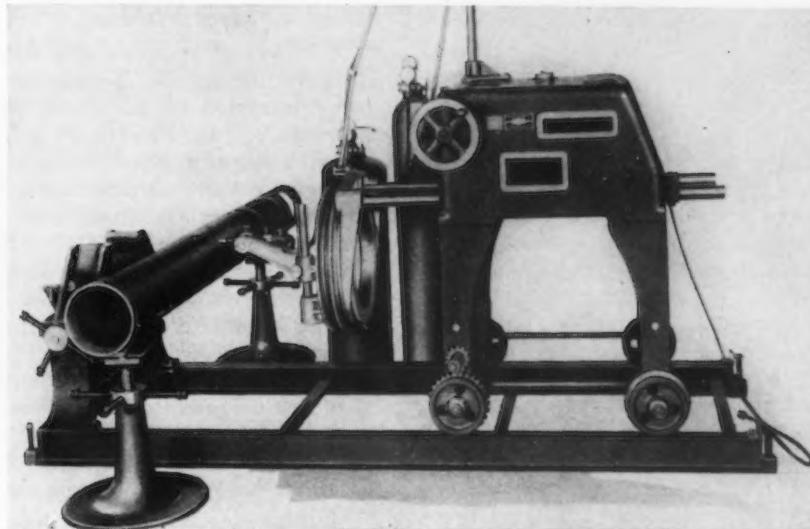
AMAGNETIC control allows this Hobart welding generator set to be started under reduced voltage, then automatically advanced to full load position.

BELOW

GOODYEAR'S Style HD safety gas welding hose will resist the action of molten metal or accidental exposure to the torch flame.



A ROTATING beam imparts reciprocating and rotary motion to the torch holder in this improved Oster torch cutting machine for pipe work.



ment and the fact that no manual adjustment is necessary during welding.

Prevents Adherence of Weld Spatter

A metal coating in the form of a very light jell that may be applied by brushing, dipping or spraying is being marketed by the *Wayne Chemical Products Co.*, 9502 Copeland Street, Detroit, to prevent the adherence of welding spatter. It contains water and instantly cools the hot welding sparks as they hit and prevents them from attaching themselves to the covered surfaces. Parts may be readily cleaned with hot water or cleaning solution. The jell eliminates the necessity of chiselling or scraping adjacent surfaces to welds.

Torch Cutting Machine

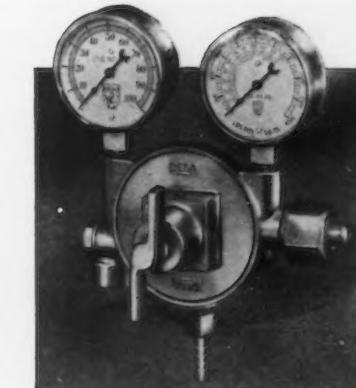
The *Oster Mfg. Co.*, Cleveland, has brought out an improved torch cutting machine for pipe jobs that has a form of generating mechanism. Known as model No. 222, it supersedes the original model No. 212 and does not require the use of cams, templates or special fixtures. The torch is mounted in a carrier that is both rotated in a ring and oscillated. The reciprocating slide that controls the movement of the oscillating lever is in turn operated through a rotating beam or lever, the settings of which are adjustable for varying pipe sizes. Once the settings are made with the aid of graduations, both motions of the head are accomplished by turning a single handwheel on the side of the case.

In effect, the motion of a torch held in the hand of an operator is dupli-

cated and without undue complication in mechanism. Pipe from $2\frac{1}{2}$ to 12 in. can be cut, including the cutting of Ts, branch reducing Ts 45 to 90 deg., elbows, miters, Ys and blunt bull plugs, as well as hole cutting. The pipe is centered in a vise or supported on roller pipe rests. The case containing the generating mechanism is mounted on four legs, equipped with flanged wheels running on a track.

Gas Regulator

A gas regulator, known as the "Regulator," combines a positive, direct first-stage nozzle type regulator and a second-stage inverse or stem type unit, thus neutralizing the characteristic discrepancies of each and resulting in a constant flow of gas, regardless of cylinder pressure. This patented apparatus is made by the *Bastian-Blessing Co.*, Chicago. The two-stage regulator is built into one compact, streamlined forged brass body. Another feature of the equipment is a new triple-filter, cartridge type strainer which serves to remove dust and dirt and also to dissipate the heat of compression caused by quick opening of



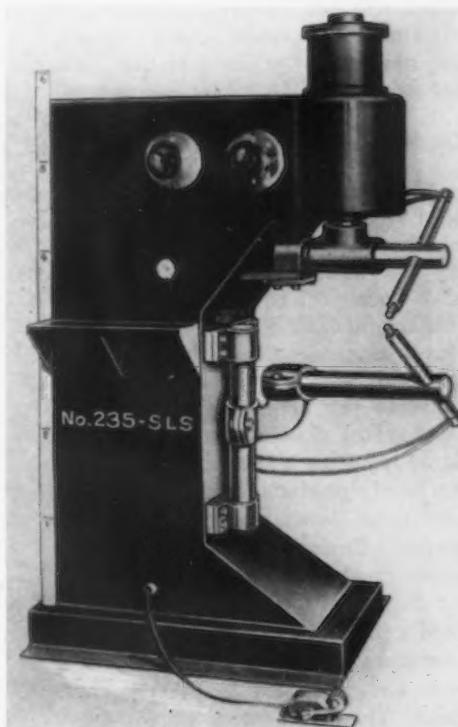
THE "Regulator" combines a first-stage nozzle type regulator and an inverse or stem type unit, neutralizing the characteristic discrepancies of each and providing uniform flow of gases.

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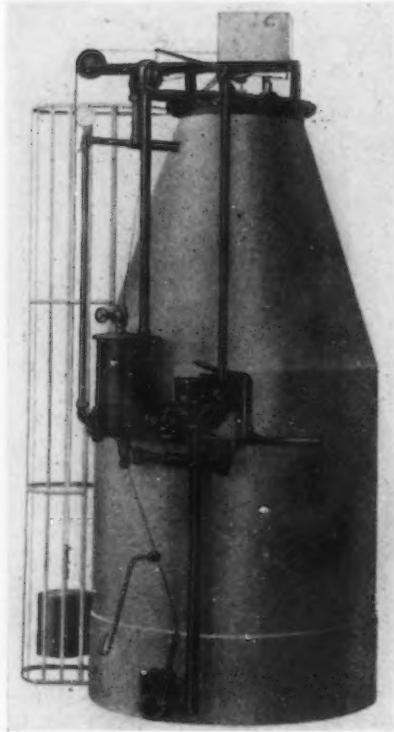
an oxygen cylinder valve, sometimes responsible for seat ignition. Application of the regulator covers the control of oxygen, acetylene, hydrogen, nitrogen and other high-pressure gases for welding, cutting, silver soldering, metal spraying and brazing operations.

Safety Gas Welding Hose

Style H D safety gas welding hose, a new product of the *Goodyear Tire & Rubber Co.*, Akron, Ohio, combines fire-resisting compounds with fabric and asbestos insulation which makes



AT RIGHT
MODEL No. 235-SLS of the Eisler line is a general-purpose spot welder made in capacities from 75 to 250 kva. All controls are within the welder body.



DOUBLE-RATED Airco acetylene generators are available in two sizes and incorporate a number of safety features.

• • •

it ideal for welding operations in close quarters, such as in steel mills. The hose will resist the action of molten metal or accidental exposure to the torch flame long enough to permit the operator to reach a place of safety. Aside from this safety feature, it has a non-kinking carcass which will not flatten permanently, it is claimed, even under severe impacts, and has a high quality tube that does not flake off.

Double-Rated Acetylene Generators

Air Reduction Sales Co., 60 East 42nd Street, New York, announces the addition of two double-rated stationary acetylene generators to their line of oxy-acetylene equipment. They are available in both 300 and 500-lb. carbide capacities and have rated delivery capacities of 600 and 1000-cu. ft. of acetylene per hour respectively. By employing double-rated generators, plants requiring a large amount of gas for steady production are enabled to meet their demand with a minimum number of units and space. The new double-rated generators are based on the design of the Airco-DB single-rated generators. The shells of both generators are of heavy gage sheet steel, hot-galvanized to prevent corrosion. These generators employ sub-

stantially the same method of feeding as in older Airco models. Feeding does not depend on gravity, the carbide being positively displaced from a feeding disk, driven by a gravity motor which is controlled by the pressure control.

The pressure regulation is said to be so accurate that a reducing valve or regulator is unnecessary. This makes it possible to maintain a higher line pressure without exceeding in the generator the maximum accepted safe acetylene pressure of 15 lb. per sq. in. Safety has been designed into every part of these generators. A system of interferences and controls requires the operator to follow a definite correct charging procedure. The relief valves are of large capacity and reliable construction. Both generators are fitted with a hydraulic back-pressure chamber and a mechanical double-action check-valve, which serves as an added protection against a flashback in the line or any reverse flow. It also serves to prevent any excess flow of gas from the generator such as might result from a break in the line.

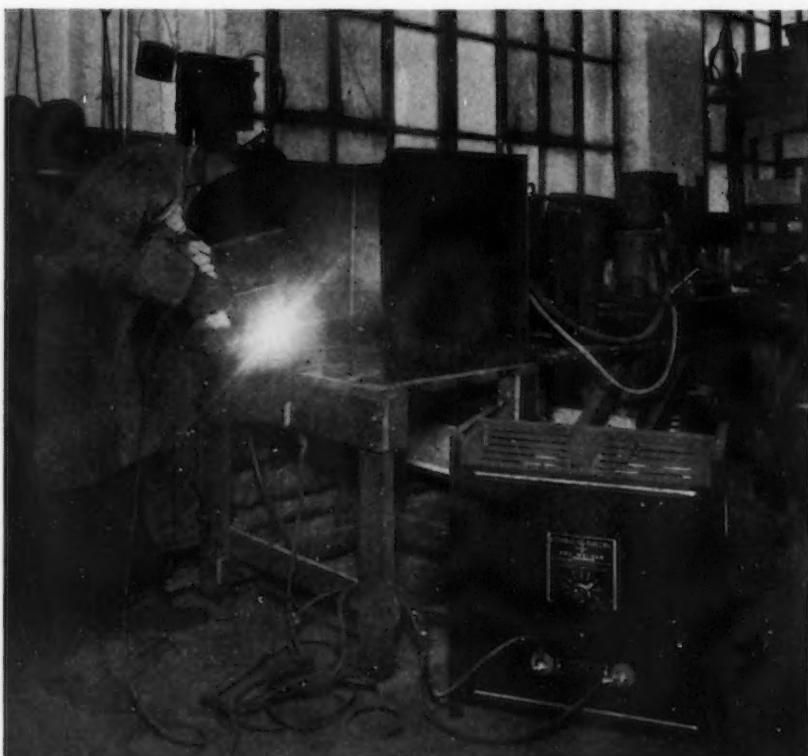
The sludge is forced out by the existing pressure in the generator without opening the generator to the atmosphere. Thus air is prevented from being drawn in, thereby keep-

ing the air concentration in the generator to a minimum value.

Spot Welders

A variety of styles of spot welders designed for specific applications are being marketed by the Eisler Engineering Co., Inc., Newark, N. J. They are all air operated and controlled by a magnetic valve actuated by a foot switch. Other controls are also available. Machine No. 235-SLS is a general purpose type and is supplied in capacities from 75 to 250 kva. Depending upon size, the transformer is air or water cooled. Current changes are obtained by a 24-point switch. Both bottom and top arms can be turned in any position, and the former has vertical adjustment also. Electrode holders are water cooled.

Machine No. 235-SLB is a 100-kva. machine having a lower arm of slide horn type with ready vertical movement to permit the welding of boxes and drawers. Special electrodes are provided for welding in corners, edges and other close quarters. By removing the arm rest, the machine is also suitable for welding tubes. Machine No. 235-SLA is another special type for use in the manufacture of metal doors and is made in a number of sizes. The upper arm can be adjusted



THIS G-E mutator arc welding set is paying for itself in six months at the plant of the Standard Mailing Machines Co., Everett, Mass. The low-current welder makes possible a saving of 85 per cent in cost in the manufacture of gear and cam assemblies for duplicating machines.

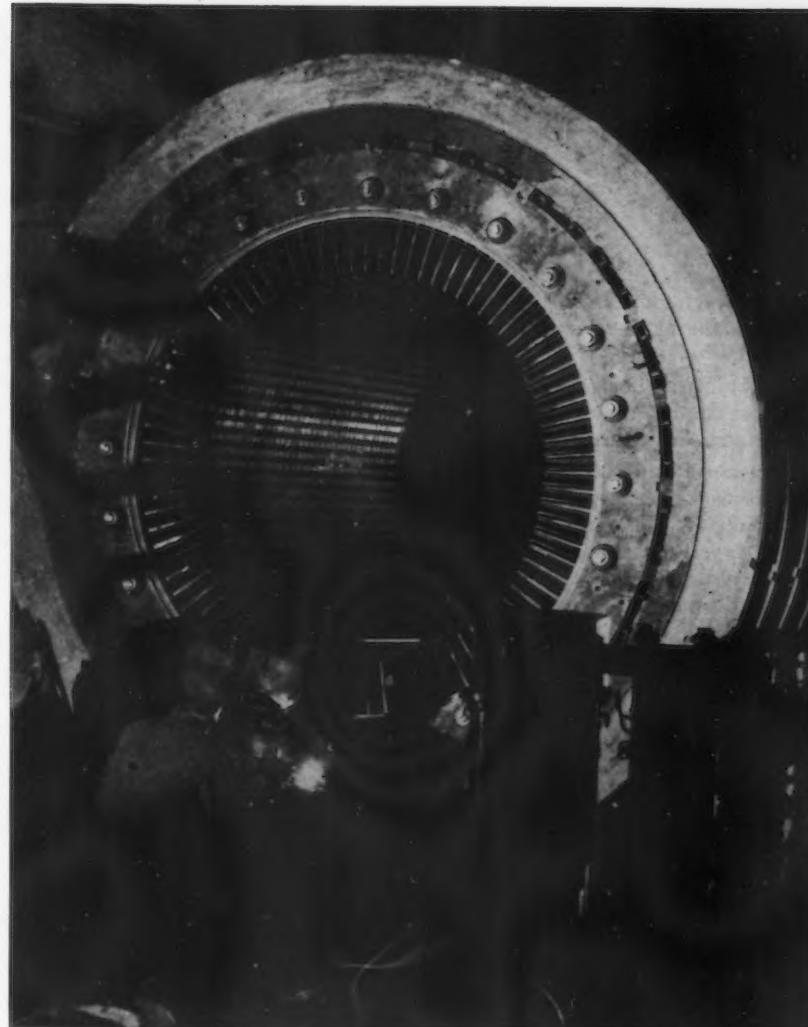
lengthwise, also vertically and can be turned in any direction. The lower arm is narrow for welding in corners and is adjusted for height on a large faceplate. Everything is enclosed, including air controls, automatic timer, contactor and electrical connections.

Machine No. 235-SLO is an Eisler unit designed for welding materials that are veneered, lacquered or otherwise coated on one side by the so-called overhead method. Both electrodes come in contact with the metal on one side only, and welding is accomplished without blistering or burning the finished surface opposite. Following the general design principle of other Eisler units, this particular machine has a roller table to handle large sheets.

Solder and Fluxes

A new high-tensile "All-Metal" solder and flux for low-temperature soldering of aluminum, cast iron, stainless steel, monel metal and zinc-base die castings has been placed on the market by the *Imperial Brass Mfg. Co.*, 1200 W. Harrison Street, Chicago. The solder is designed for use with a special flux which is used to dissipate the oxides, and with it the solder is said to form a bond with a tensile strength many times that of soft solders. Melting to about 500 deg. F., it is said to withstand temperatures high enough to permit its use in repairing tanks, valves and pipes on hot water or low-pressure steam systems. The solder may later be machined, polished or plated.

"Kwikflux" is a quick-acting hard soldering and brazing flux being marketed by *Special Chemicals Corp.*, 30 Irving Place, New York. The fluxing action begins at 212 deg. F., and the material has a fluxing point from 785 to 1600 deg. According to the seller, the flux does not evaporate at high temperatures and has a low vapor tension, maintaining its volume at such temperatures. Hence it is especially suitable for high melting point solders, and can be used with any of the com-



LECTRIC brazing the ends of copper bars or "damper windings" to provide a freer course for eddy currents on a 35,000-kva. generator being built at the East Pittsburgh works of Westinghouse Electric & Mfg. Co. Brazing material is in the form of a small bronze tube.

mon metals, including stainless steel. The flux comes in the form of a paste which is mixed with water for use. The excess flux readily washes off. It is non-toxic.

A line of protective clothing for welders is being made by the *Davis Emergency Equipment Co., Inc.*, Graybar Building, New York, in three dif-

ferent materials—fireproof duck, asbestos and chrome leather. Chrome leather is superior to the other materials since it remains soft under heat and is much more durable. These garments protect the welder from ultraviolet light, as well as from heat and sparks. They are designed to give the worker maximum ease while working.

Selective Hardening of Ferrous Metals With the Oxy-Acetylene Flame

(CONTINUED FROM PAGE 35)

progressive rotary or spinning operations by means of a small variable geared motor mounted on the holding fixtures at the front or side of the machine.

An automatic device lights the torches at the beginning of the stroke and extinguishes them at the finish.

For general applications the equipment consists of a large capacity water-cooled oxy-acetylene blowpipe and various types of water cooled multi-flame heads which pass about 100 to 300 cu. ft. of gas per hr.

There are many applications where the large capacity head is not applicable, as on small work. In such instances a smaller mixer is all that is necessary. The water-cooled heads in use today are of two general types, one for gear teeth and the other for flat or curved work.

In gear hardening the head is designed to allow operation in the restricted area between the teeth.

Twin torches heat and quench both sides of the tooth simultaneously, reducing time of operation and minimizing tooth distortion.

In the earlier design quenching was accomplished by a special pipe in back of the flame head. In the modern method the quench is built into the head.

Stress Relieving Essential

Drawing or stress relieving is absolutely essential and should follow closely after quenching. This operation is performed in a standard type heat-treating furnace or an oil bath at temperatures not to exceed 400 deg. F. This low temperature is sufficient to relieve the stresses set up by quenching but has very little if any effect upon the hardness. After this drawing operation the work may be removed from the furnace and cooled in still air or may be furnace cooled if desired.

Applications Cover Wide Field

Flame hardening is not confined solely to the hardening of gear teeth; on the contrary its application covers a vast commercial field. Among the most prominent applications are the hardening of track wheels for conveyors and locomotive cranes, racks and shroud pinions for steam shovels, and

in this same category we may include bull rings and dipper teeth. Rolling mills and rubber mills have adopted its use in all phases of these industries, and in the agricultural field we find that delicate edges, such as plow shares, can be uniformly and successfully hardened. Trackways, cams, camshafts, crankshafts, and jaw clutches in all fields have found this method the most practical from both a production and an economy standpoint.

Additional Tool for Industry

Who, only a few years back would have thought it possible to machine a part complete to size and then harden only the portion desired without distortion. Hardening the teeth only, on a gear 8 ft. in diameter and weighing 9000 lb. would have been considered an impossibility. Today it is a common procedure. Still this art is in its infancy. It has many limitations. How long before these will be overcome, is a logical inquiry. "It will not be in our time" is the reply of the skeptic. But those familiar with the research quietly going on, know that it won't be long.

Torch hardening will never replace all other known forms of heat-treating. It will not even equal many of them, but it gives to industry a new tool that will permit the hardening of many parts heretofore considered impractical. With the aid of ingenuity, many new and as yet untried applications will be attempted. Many failures will be encountered, and as many new uses will be found. Through untiring efforts to reach a new goal, this industry will continue to expand.

New Uses for Old Grinding Wheels

(CONTINUED FROM PAGE 46)

steel dressing plants have been used with success for mold dressings to replace silica flour. The high alumina mixtures, moreover, show greater resistance to certain steels which readily form silicate slags and have been used both for mold paints and for the improvement of shank ladle linings

used with these steels. The introduction of graded emery scrap to steel molder's compositions has only been limited by inadequate supplies of scrap.

Used as Furnace Lining

High alumina material, on account of good electrical resistance and refractoriness, is employed in securing the heating elements in electric resistance furnaces, and there is reason to believe that it would be practicable to form rammed linings of high frequency furnaces by using selected grades of scrap emery. In this connection, the adulteration of the mixture by the detritus of the clay bond has to be taken into consideration. Finally, the next application is not of a refractory nature, but as a foundry abrasive. It is not suggested that foundries should make their own abrasive cutting-off wheels for oil-sand stick cores, but where trimming of hard cores is necessary in fitting up intricate molds, steel files and tools wear very quickly, and suitable hand size pieces of emery wheels are greatly prized by the molder.

Tiering and Stacking Equipment To Cut Storage Costs

(CONTINUED FROM PAGE 41)

location and there raises it to medium height for tiering. If required, a ram attachment may be fastened directly to the scoop plate to enable the truck to pick up rolls or coils of material, ram-fashion.

The Mercury center control telescoping, tilting, fork-lift truck shown in Fig. 12 is of the front wheel drive, rear wheel steer type. It is available in four wheel-base sizes, with a maximum capacity of 10,000 lb. on 36-in. forks; the forks traveling from a lowered position of 1 3/4 in. above ground to a height of 107 in. Special elevating mechanism can be furnished to give a maximum lifting height of 144 in. above ground. The fork lift is hydraulically actuated, and the spread of the forks can be altered by a demountable crank. This unit has a travel speed of 5 1/2 miles per hour light, or approximately 5 miles per hour loaded.

Hammond Machinery Builders, Kalamazoo, Mich., has moved its Eastern branch to larger quarters at 71 West 23rd Street, New York, under direction of W. J. Holtmeier, Eastern manager, who is planning a display of several models of polishing lathes and grinders.

Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	January 1938	December 1937	November 1937	December 1936	Twelve Months 1936	Twelve Months 1937
Steel Ingots: (gross tons)						
Monthly output ^a	1,732,266	1,472,241	2,153,781	4,424,367	46,807,780	49,507,766
Average weekly output ^a	391,031	333,086	502,047	1,000,988	895,329	949,516
Per cent of capacity ^a	29.14	25.36	38.22	76.42	68.36	72.39
Pig Iron: (gross tons)						
Monthly output ^b	1,429,085	1,490,324	2,006,724	3,115,037	30,618,797	36,611,317
Raw Materials:						
Coke output ^c (net tons)	2,996,525	3,395,956	4,599,700	46,275,200	52,362,098	
Lake ore consumed ^d (gross tons)	1,916,588	2,734,504	4,551,379	44,639,318	53,996,076	
Castings: (net tons)						
Malleable, production ^e	27,784	32,457	61,674	571,696	602,278	
Malleable, orders ^e	19,753	28,170	67,035	576,334	549,972	
Steel, production ^e	41,537	51,294	83,615	805,691	1,019,896	
Steel, orders ^e	27,024	31,442	159,430	909,080	877,459	
Finished Steel: (net tons)						
Trackwork shipments ^f	3,135	3,804	4,289	5,579	68,813	92,121
Fabricated shape orders ^f	99,070	132,835	166,542	1,609,016	1,628,641	
Fabricated shape shipments ^f	108,396	130,156	121,775	1,548,205	1,660,570	
Fabricated plate orders ^f	27,463	27,507	51,017	484,036	428,884	
U. S. Steel Corp. shipments ^f	518,322	489,070	587,241	1,067,365	10,784,273	12,825,467
Ohio River steel shipments ^f	67,875	70,600	111,450	1,169,321	1,305,870	
Fabricated Products:						
Automobile production ^g	346,886	376,637	519,132	4,616,857	5,016,565	
Construction contracts ^g	\$195,472,000	\$209,451‡	\$198,465‡	\$199,696‡	\$2,675,296‡	\$2,913,060‡
Steel barrels shipped ^g	644,287	748,015	895,481	8,600,493	9,869,212	
Steel furniture shipments ^g	\$2,125‡	\$2,024‡	\$2,113‡	\$19,246‡	\$26,973‡	
Steel boiler orders ^g (sq. ft.)	546,615	609,577	1,872,139	11,511,557	9,923,457	
Locomotives ordered ^g	9	77	13	112	533	368
Freight cars ordered ^g	25	3,287	1,625	19,035	68,341	52,788
Machine tool index ^h	118.4	142.7	127.7	257.7	201.7†	140.8†
Foundry equipment index ^h	111.2	128.0	283.3	219.3†	142.4†	
Non-Ferrous Metals: (net tons)						
Lead shipments ⁱ	34,020	33,853	51,646	513,361	575,933	
Lead stocks ⁱ	129,131	113,573	171,856	.....	.....
Zinc shipments ^j	24,931	29,545	32,676	59,512	561,969	570,111
Zinc stocks ^j	88,532	64,776	42,534	44,955	.....
Tin deliveries ^k (gross tons)	5,550	5,020	5,195	6,930	74,005	83,665
Refined copper deliveries ^l	30,705	22,788	37,025	89,076	819,007	865,336
Refined copper stocks ^l	299,133	259,908	221,676	161,068	.....
Exports: (gross tons)						
Total iron and steel ^r	626,418	556,591	244,173	3,157,341	7,567,884	
All rolled steel ^r	259,113	263,418	126,173	1,167,244	2,597,083	
Finished steel ^r	191,442	218,777	117,979	1,040,815	2,125,157	
Scrap ^r	319,016	254,072	103,298	1,877,136	4,039,143	
Imports: (gross tons)						
Total iron and steel ^r	25,792	26,996	52,584	666,728	533,160	
Pig iron ^r	9,128	6,661	10,423	165,909	111,697	
All rolled steel ^r	14,475	15,592	19,968	270,594	284,571	
British Production: (gross tons)						
Pig iron ^s	761,100	783,800	762,300	671,400	7,681,600	8,495,200
Steel Ingots ^s	1,081,400	1,103,800	1,178,300	1,019,200	11,699,000	12,964,000

†Three months' average. ‡1000 omitted.

Source of data: ^a American Iron and Steel Institute; ^b THE IRON AGE; ^c Bureau of Mines; ^d Lake Superior Iron Ore Association; ^e Bureau of the Census; ^f American Institute of Steel Construction; ^g United States Steel Corp.; ^h United States Engineer, Pittsburgh; ⁱ Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; ^j F. W. Dodge Corp.—37 Eastern states; ^k Railway Age; ^l National Machine Tool Builders Association; ^m Foundry Equipment Manufacturers Association; ⁿ American Bureau of Metal Statistics; ^o American Zinc Institute, Inc.; ^p New York Commodities Exchange; ^q Copper Institute; ^r Department of Commerce; ^s British Iron and Steel Federation.

... . . . THIS WEEK ON THE

... Price cuts come as auto output starts upward swing.

• • •

... Pick-up in retail sales finds dealer stocks in healthy state.

• • •

... Plant to be tooled for producing Ford's new tractor at River Rouge.

• • •

... State commissioner asks tax on industry to support labor department.

DETROIT, Feb. 14.—Price cutting which appeared last week in a key steel product has had the general effect of upsetting buying programs in the automobile industry and has led to an infinite amount of speculation about automobile prices.

After the bombshell announcement that cold rolled sheets had been reduced \$4 a ton, checkup showed a strange disparity in the price structure as it affects automobile company steel buyers. Taking a cold rolled mill run 20-gage sheet, for example, the price scanners find that it did have a base of 3.45c. per lb. f.o.b. Pittsburgh, plus an oiling charge of 10c., giving a net price of 3.55c. When the producers waived the oiling charge and reduced the base price 10c., it brought this item down to 3.35c., which is exactly the same as the 20-gage hot rolled annealed sheet, pickled and oiled. This removes any incentive to save money by buying the hot rolled annealed sheet for use in hood side panels or door panels where it has frequently been used.

At least a month ago, one steel buyer complained that the price difference then was so slight that it was almost as economical to buy the cold rolled sheet and thereby avoid minor difficulties in the shop and get better finish on the completed part. This buyer predicted that the operators of some of the so-called black sheet mills would soon be forced to lower their prices to get a greater spread between the hot rolled and cold rolled sheets. The new price set-up multiplies the

difficulties, of course, and appears to make further price readjustment imperative with regard to these items.

Steel Stocks Still Ample

In view of the present circumstances in the automobile industry, it hardly appears probable that this industry had a direct hand in forcing a change in steel prices, although the buyers had attempted to bring some pressure to bear. In the first place, none of the consumers has been in a position to buy heavily enough to be an important factor. Chrysler, with its greatly reduced production and sizable inventories, was eliminated from the picture almost from the start. Packard, Briggs and Fisher Body have all reported enough steel on hand to last until the first of April and, less than a week ago, Fisher was reported completely out of the market for 30 to 60 days. The Ford Motor Co. placed some tonnage the end of January but can point to its open hearths operating at half capacity as an indication of the fact that Ford is not in the market for steel.

As a matter of record, the dribble of steel business that had been noted in this area disappeared after news of the price change got around by telephone Tuesday and Wednesday.

Automobile Prices

It has been the opinion of automotive men that a reduction in automobile prices was unwarranted unless steel or labor costs dropped. Despite denials from the automobile companies, new spring prices are in the

wind, and will probably come within the next few weeks. After Packard's reduction of \$100 in the price of its Six, Alfred P. Sloan, chairman of the board of General Motors, on being asked to comment from the standpoint of the effect on the general trend of automobile prices, stated that it was apparent that the reduction announced, applying as it did to one line only, was more in the nature of a readjustment of that particular line to present competitive levels than it was to establish any new price level.

Car Output Gains

With all assembly lines back in production this week, output moved upward sharply, totaling 57,810 passenger cars and trucks in the United States and Canada, compared with 51,443 the previous week and 74,145 in the corresponding week of last year, according to Ward's Automotive Reports. Chrysler was a principal factor in this restoration. It resumed operations Tuesday, Feb. 8, and was scheduled to be in production Feb. 8, 9, 10, 15, 16 and 17. Tentatively the company has also planned to operate Feb. 22, 23 and 24. Output is expected to increase gradually for the next eight or ten weeks. This increased production is scheduled in line with the industry's policy of manufacturing cars in numbers corresponding to the sales demand reported from the field.

Car Sales Increase

Reversing the trend of recent months, sales of new passenger cars increased during January, according to the R. L. Polk & Co. Figures are available for only 17 states, but they show sales running 2.82 per cent ahead of the same number of states reporting in December. January figures, however, fell more than 41 per cent behind the same figures reported in January, 1937. The truck sales situation appears even better in the 17 states. January sales showed an increase of nearly 24 per cent over the December data. This represents, however, a decrease of about 44 per cent for the same states in January last year. The Polk company estimates January passenger car sales at 174,000 and truck sales at 34,000.

Factory sales to dealers throughout

ASSEMBLY LINE . . .

By W. F. SHERMAN
Detroit Editor

the industry lagged a long way behind retail sales. The Automobile Manufacturers' Association estimates the figure at 223,100, approximately 26 per cent under December and 44 per cent under January, 1937. Similarly, General Motors Corp. sales to dealers totaled only 94,267, compared with 160,444 in December and 103,668 a year ago. This is a healthful indication because it means that dealers are not being overlooked. Dealer stocks are still high, but inquiries and deliveries have been better. A moderate improvement in retail sales normally has an effect on production about two weeks after it is definitely manifested in the field.

The quickening effect of the successful campaign to dispose of second-hand cars should improve this situation. Price reductions, added to these other favorable factors, are expected to turn production totals sharply upward.

Buick and Cadillac-LaSalle supply figures which show that these favorable factors are present. In each 10-day period in January, domestic retail deliveries in new Buick cars jumped sharply. At the same time, used car sales have been on the increase.

"The volume of used car sales during the month exceeded that of January a year ago by 1100 cars," Buick announced through W. F. Hufstader, general sales manager. "Used car stocks are fewer than 3000 cars ahead of this time a year ago; at the current rate of turnover, the number of days' supply on hand is approximately the same as last year." Total used car deliveries to Buick dealers during the month reached 24,660, compared with 23,567 last January.

Cadillac-LaSalle reports the second-best January in its history in total deliveries. General Sales Manager D. E. Ahrens said, "Our volume of 2089 cars topped every preceding January with the exception of a year ago." He added that used car inventories in January decreased for the first time in months.

Chevrolet Led Ford in 1937

In the race between Ford and Chevrolet for sales last year, the decision finally went to the General Motors entrant, with Chevrolet leading 768,040 to 765,933, a difference of 2107 passenger car registrations. A year ago the figures were 930,250 for Chevrolet and 748,554 for Ford. Pro-

duction estimates, which are believed to be accurate within 2 per cent, show that Chevrolet produced more cars and trucks than Ford during 1937. The figures are Chevrolet—1,172,648; Ford—1,094,901. For comparison, the following are the figures for Plymouth. 1937 production, 528,066; 1937 registrations, 461,373; 1936 registrations, 499,580.

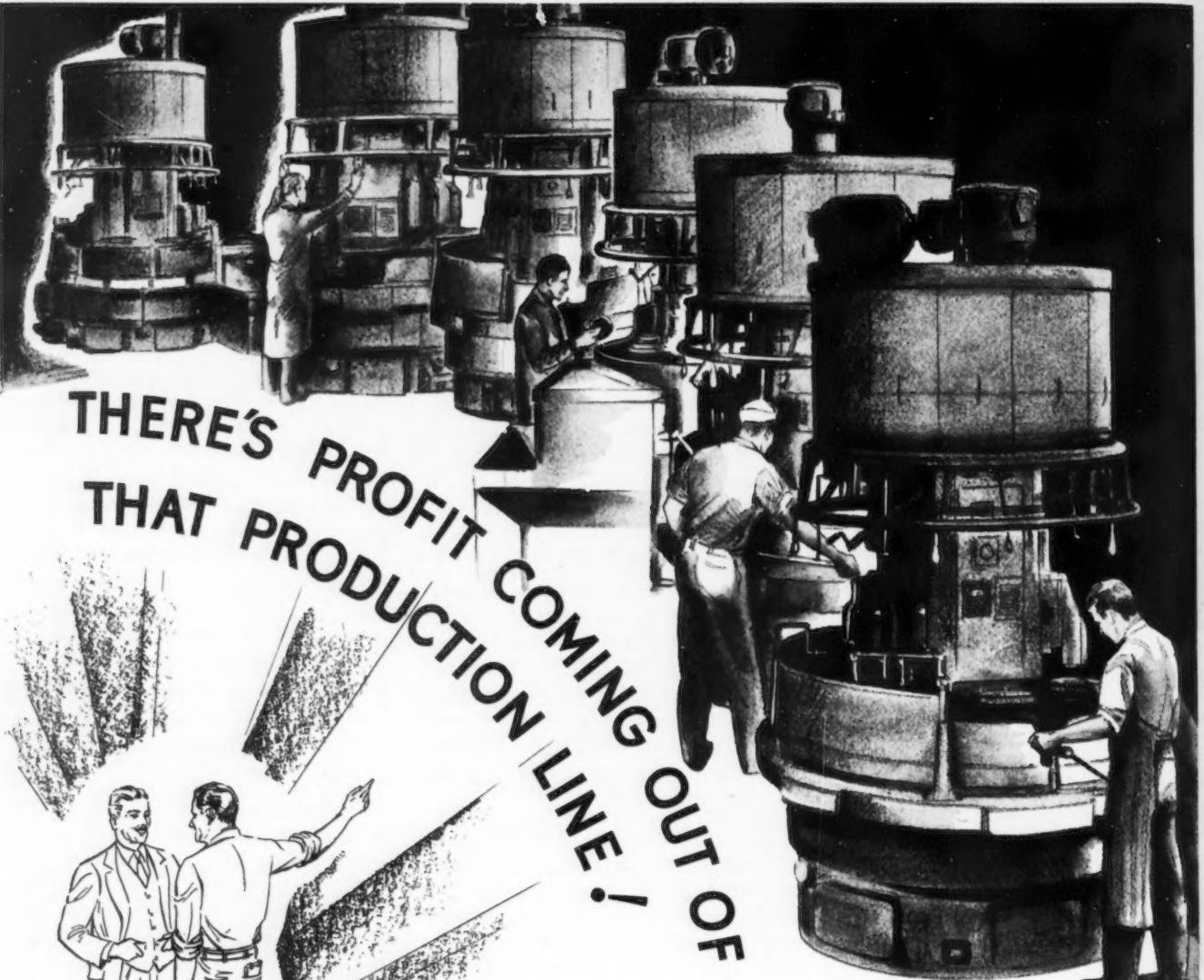
The return of Chrysler workers to their jobs during the second week in February should help boost the employment index figure of the Detroit Board of Commerce, which at the beginning of the month had fallen to 79.8, as compared with 88.6 on Jan. 16, and 126 at the end of January last year.

Ford's Tractor Plans

Henry Ford's ambitious plans for the production of a new tractor are beginning to take shape at the River Rouge plant. His announcement to a press representative a few weeks ago took many Ford men by surprise, but speeded preparations considerably. Inquiries are now being made for manufacturing equipment necessary to handle the work on the new product. The tractor will probably use the 85

BUILT to order for the Hudson Motor Car Co., the new Maniplex sewing machine shown at right is used in preparing the upholstery for the Hudson "112" seats and seat backs. Four operators are required. Three of them are shown guiding the cotton padding and upholstery into the machine. The fourth operator stands on the other side and cuts the material to length when it comes through. The machine operates eight needles simultaneously, sewing the braid on four plaited and at the same time forming a piping. Because the cloth is guided through the machine, the sewing is more accurate, with plaited kept parallel.





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THAT PRODUCTION LINE!

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Ask Bullard Engineers to figure your jobs the Multi-Au-Matic way. You'll be assured of the Savings you'd probably like to have right now.

THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

hp. V-8 engine. No new building will be erected at present for tractor manufacturing because a section of one of the present buildings will be cleared out when the new consolidated tool and die shop is completed and put in operation.

UAW Holding Mass Meetings

Mass meetings similar to the one held in Cadillac Square, Detroit, more than a week ago are planned for several major cities in Michigan by the United Automobile Workers Union, according to Homer Martin, president. He said the demonstrations would "let the country know the state in which automobile workers find themselves." First of the out-state gatherings was scheduled to be held in Flint Saturday afternoon on the anniversary of the settlement of the General Motors strike last year. Others are being planned for Lansing, Bay City and Saginaw.

Flint was the scene last week of the state convention of the Michigan Federation of Labor. After four hours of heated debate at the closing session Friday, the AFL affiliate adopted a resolution calling upon CIO members to "cease following the leadership of the Fascist-minded dictator who seeks to frustrate the efforts of sane leadership." The strongly worded resolution against John L. Lewis split the delegates and threw the closing hours of the convention into an uproar. Frank X. Martel, president of the Detroit and Wayne County Federation of Labor and a co-sponsor of the resolution, charged that the CIO had encouraged dual unionism in Michigan and declared that CIO interference had caused Port Huron AFL workers "to use baseball bats to break through CIO pickets to get into the Mueller Brass Co. plants." During the four-day convention, 77 resolutions were presented, 75 adopted. Most of the proposals dealt with changes in labor laws which the federation will seek at the next session of the Legislature.

Assessment of the entire cost of the State Department of Labor and Industry against the owners of industry rather than against taxpayers in general was urged at the convention by George A. Krogstad, State Labor Commissioner. He justified the proposal "because the employer will profit by the department's work in reduction of compensation insurance rates." Strengthening of factory inspection laws and the department's force of factory inspectors was suggested by Krogstad. Michigan now has only 12

factory inspectors as compared with 225 for New York State, he declared.

Model Agreement for Die Shops Planned

As the auto industry launches one of its largest tool and die programs in years, the Tool and Die Manufacturers' Association of Detroit is making plans to insure trouble-free operation of the independent tool and die shops in Detroit by negotiating a

model agreement with the CIO to apply to unionized plants in the area which are members of the association. Of 60 member plants, approximately 20 now have contracts with the CIO and 10 or 12 have contracts with the MESA or other unions. Most of these contracts will expire this spring and separate negotiations, it is feared, might lead to interruptions of production.

Machine Tool Orders Continue Down Trend

DESPITE a slight bulge in December, the downward trend in machine tool orders that began October is being continued. According to the National Machine Tool Builders Association, the three-month moving average, which gages the trend, is down to 129.6, as compared with 140.8 in December and with 187.2 in September, 1937. High point of the year was 234.2, recorded in May. This is also the highest point on record since

these statistics were compiled, beginning in 1919.

The January index of orders stood at 118.4, using 1926 shipments as 100. The December index was 142.7 and the November figure, 127.7. In January, 1937, the index stood at 200.3. Both domestic and foreign orders for January dropped below the December volume, but the foreign index at 75.2 is still substantially above the average prevailing for the previous year and accounts for 63 per cent of the orders placed. Foreign business continues to be the buoyant factor in holding the business for the industry above the average for the last five years, which for 1933 to 1937 inclusive is 96.6.

OUT OUR WAY

BY J. R. WILLIAMS



Steel Products Made For Sale in 1937

THE American Iron and Steel Institute's report of semi-finished and finished steel produced for sale in the fourth quarter and for all of 1937 shows total steel products produced for sale, less shipments to members of the industry for further conversion into finished products, amounting to 34,236,748 gross tons compared with 31,184,389 tons in 1936, a gain of about 9.8 per cent. The 1937 output represented 72.6 per cent of finishing capacity while that of 1936 was 67.7 per cent.

One of the largest gains last year was in tin mill products. Tin plate

output was 2,961,812 tons against 2,656,680 tons in 1936, while black plate last year totaled 572,229 tons against 493,079 tons in 1936.

There was also a large increase in the production of sheared and universal plates—3,033,303 gross tons in 1937 against 2,321,201 tons in 1936.

Despite the fact that steel production as a whole gained over 1936, there were some items in which losses were shown last year as compared with the previous year.

The branch of the industry which operated at a highest rate of capacity

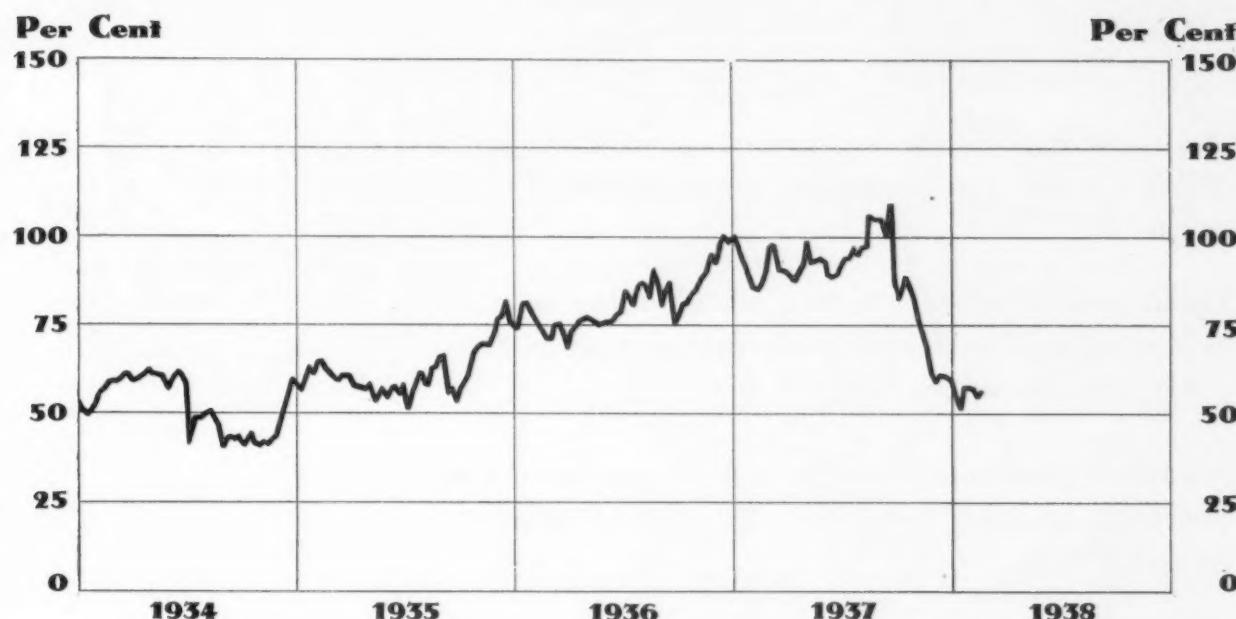
during the year was tin plate—83.2 per cent. In sheets there was a production of 73.7 per cent of capacity, with a total output of 7,481,468 tons. Strip mills averaged better than 60 per cent. The total of bar mill products was 6,069,690 tons against 6,186,767 tons in 1936.

Export of semi-finished and finished steel products totaled 2,435,149 tons, in which the largest item was sheets (all classes), 397,760 tons; next was tin plate with 388,695 tons; plates were in third place at 382,172 tons. Exports of ingots and semi-finished steel were 342,150 tons.

				Fourth Quarter - 1937							
				PRODUCTION FOR SALE—GROSS TONS							
				Current Quarter				Shipments			
				Total	Per cent of capacity	Export	To members of the industry for conversion into further finished products	Total	Per cent of capacity	Export	To members of the industry for conversion into further finished products
STEEL PRODUCTS	Ingots, blooms, billets, slabs, sheet bars, etc.	31	1	509,877	xxx	99,509	188,216	3,784,978	xxx	342,150	2,164,981
	Heavy structural shapes	9	2	4,739,805	339,811	28.7	19,371	-	2,490,007	52.5	117,725
	Steel piling	4	3	268,800	17,305	26.1	1,494	-	106,140	40.1	7,375
	Plates—Sheared and Universal	22	4	6,335,219	426,025	26.9	88,421	1,302	3,033,303	47.9	382,172
	Skelp	7	5	59,857	xxx	4,132	35,764	605,192	xxx	72,682	344,444
	Rails—Standard (over 60 lbs.)	4	6	3,575,000	171,162	19.2	60,856	-	1,276,389	35.7	83,961
	Light (60 lbs. and under)	7	7	433,500	12,155	11.2	1,003	-	96,130	22.2	12,623
	All other (Incl. girder, guard, etc.)	2	8	140,000	2,227	6.4	22	-	38,662	27.6	6,186
	Splice bar and tie plates	15	9	1,472,195	28,992	7.9	6,004	-	450,083	30.6	10,778
	Bars—Merchant	41	10	507,060	xxx	36,298	42,953	3,751,068	xxx	110,804	417,263
	Concrete reinforcing	29	11	121,496	xxx	12,367	-	789,946	xxx	35,203	xxxxxx
	Cold finished—Carbon	18	12	90,572	xxx	2,571	-	635,791	xxx	7,981	xxxxxx
	Alloy—Hot rolled	16	13	119,892	xxx	2,513	10,867	710,419	xxx	11,660	56,740
	—Cold finished	13	14	18,461	xxx	388	-	90,524	xxx	1,365	xxxxxx
STEEL PRODUCTS	Hoops and baling bands	4	15	17,503	xxx	164	-	91,942	xxx	1,072	xxxxxx
	TOTAL BARS	60	16	11,644,953	874,994	30.1	54,301	53,820	6,069,690	52.1	168,095
	Tool steel bars (rolled and forged)	17	17	106,092	8,252	31.1	62	-	46,359	43.7	180
	Pipe and tube—B. W.	16	18	1,308,472	125,200	27.7	4,846	-	778,088	43.0	28,944
	L. W.	11	19	1,469,099	105,699	28.8	3,313	-	680,048	46.3	25,042
	Electric weld	4	20	588,107	35,824	24.4	2,416	-	198,379	33.7	3,619
	Seamless	15	21	2,775,328	347,537	50.1	27,886	-	1,659,582	59.8	101,081
	Conduit	7	22	155,270	13,459	34.7	236	-	79,790	51.4	2,420
	Mechanical Tubing	5	23	188,800	23,696	50.2	2,589	-	123,282	65.3	7,262
	Wire rods	19	24	95,582	xxx	13,808	29,058	676,648	xxx	54,762	216,084
	Wire—Drawn	35	25	1,399,827	195,398	41.4	11,733	2,086	1,206,452	63.8	58,713
	Nails and staples	19	26	1,125,356	65,296	23.2	4,328	-	486,050	43.2	21,809
	Barbed wire and fence	17	27	1,181,008	39,200	13.3	5,507	-	369,354	31.3	35,032
	Bale ties	11	28	115,277	6,305	21.9	30	-	51,440	44.6	248
	All other wire products	5	29	31,000	830	10.7	1	-	6,151	19.8	2
	Fence posts	15	30	150,100	9,074	24.2	234	-	62,118	41.4	1,195
	Black plate	12	31	572,229	80,911	56.6	5,899	27,144	384,449	67.2	18,985
	Tin plate	14	32	2,961,812	521,037	70.4	119,612	-	2,462,763	85.2	388,695
STEEL PRODUCTS	Sheets—Hot rolled	19	33	244,346	xxx	22,937	1,300	1,886,057	xxx	94,033	36,397
	Hot rolled annealed	21	34	282,281	xxx	25,192	105	1,887,020	xxx	87,347	1,416
	Galvanized	16	35	197,631	xxx	21,748	-	1,188,368	xxx	81,101	xxxxxx
	Cold rolled	19	36	378,910	xxx	37,137	-	2,030,690	xxx	117,860	xxxxxx
	All other	16	37	84,329	xxx	3,885	-	549,523	xxx	17,419	xxxxxx
	TOTAL SHEETS	29	38	10,157,327	1,187,497	46.8	110,899	1,405	7,481,468	73.7	397,760
	Strip—Hot rolled	28	39	3,475,674	338,263	38.9	11,585	35,684	2,108,024	60.7	60,300
	Cold rolled	39	40	1,200,333	108,845	36.3	1,838	-	729,267	60.8	9,126
	Wheels (car, rolled steel)	5	41	380,319	22,855	24.0	741	-	168,144	44.2	2,499
	Axles	5	42	425,900	25,438	23.9	10,901	-	137,525	32.3	12,392
	Track spikes	11	43	308,458	8,618	11.2	78	-	92,524	30.0	1,125
	All other	6	44	27,907	964	13.8	112	-	6,619	23.7	223
	TOTAL STEEL PRODUCTS	149	45	5,808,173	xxx	673,767	374,479	37,945,108	xxx	2,435,149	3,708,360
Estimated total steel finishing capacity based on a yield from ingots of 70.5%				46	47,190,500	xxxxxx	46.1	xxxxx	xxxxxx	72.6	xxxxxx
IRON PRODUCTS	Pig iron, ferro manganese and spiegel	31	47	1,441,280	xxx	102,013	247,031	6,542,321	xxx	395,545	1,679,892
	Ingot moulds	4	48	50,394	xxx	941	-	377,495	xxx	5,387	xxxxxx
	Bars	15	49	237,019	4,955	8.4	24	79	55,115	23.3	184
	Pipe and tubes	4	50	185,457	6,017	13.0	150	-	48,223	26.0	810
	All other	4	51	113,660	1,508	5.3	-	166	15,554	13.7	1,985
TOTAL IRON PRODUCTS (ITEMS 49 to 51)				16	52	478,176	12,478	10.4	174	245	118,892
Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current quarter 5,433,694 G.T.; 46.1% of Finishing Capacity. To date 34,236,748 G.T.; 72.6% of Finishing Capacity. The above tonnages represent 70.5% of the ingots produced by companies whose products are included above.											

Total Companies Included - 174

Capital Goods Production Shows Slight Improvement



THE IRON AGE Weekly Index of Capital Goods Activity

	Week Ended Feb. 12	Week Ended Feb. 5	Comparable Week 1937	Comparable Week 1929
Steel ingot production	40.6	42.3	107.5	116.6
Automobile production	61.1	54.6	78.4	137.5
Construction contracts	74.0	71.5	76.6	130.7
Forest products carloadings	49.8	48.7	61.8	113.9
Production and shipments, Pittsburgh District	54.7	56.0	109.1	118.8
Combined index	56.0	54.6	86.7	123.5

PRODUCTION of capital goods in the week ended Feb. 12 showed the first improvement in four weeks and THE IRON AGE seasonally adjusted index advanced 2.5 per cent to 56 per cent of the base years. The present position of the index is 1.4 points below the high point of the year to date, but 1.3 points above the position of the index in the first week of the year. In order of weighted importance, the automobile series registered the largest gain, advancing 6.5 points to 61.1 per cent of the 1925-27 average. Automobile assemblies for the week were 57,810 units, an increase of 6367 above the preceding week. The construction series continued to show unexpected contra-seasonal strength, the current position of this index being 74 as against 71.5 a week ago. Construction

contracts reported during the week amounted to \$54,831,-000, of which \$30,556,000 were for private construction. The volume of private awards is 42 per cent over the previous week and 152 per cent above a corresponding week in 1937. An award involving \$5,422,000 for light and power improvements for the Consolidated Gas, Electric Light & Power Co., Baltimore, was the largest individual award reported. A moderate decline in industrial production and originating shipments was recorded in the Pittsburgh district, due largely to the influence of the mild weather on coal shipments, and the index of this component receded 1.3 points to 54.7. Carloadings of forest products increased 1500 cars to 26,269, advancing the index position of this series 1.1 points to 49.8.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

THIS WEEK IN WASHINGTON

... Railroads expected to be granted substantial part of 15% freight rate increase; early action by ICC expected.

... Opponents of advance in iron ore shipping costs cite records that 25 steel makers earned average of 2.4% yearly in 10-year period.

... Industrial Economics Bureau to carry out broad scale planning of production and distribution proposed by Richberg.

By L. W. MOFFETT

Resident Washington Editor
The Iron Age

ber, and farm products. The time of the decision generally is given as one month to six weeks, though some "guesses" are that it will be handed down by March 1. Still others go beyond six weeks. All of which shows they are guesses.

Objections From Steel Firms

The only section of the iron and steel industry which made a presentation in the case was confined to interior plants whose protest was against the proposed increase of 15 per cent in iron ore rates. Such producers as the Bethlehem Steel Co., Republic Steel Corp., the Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., Pittsburgh Steel Co., American Rolling Mill Co., Weirton Steel Co., and Wheeling Steel Corp., protested against the proposed advance in ore rates from lower Lake Erie ports. Opposition to increased ore rates from New Jersey mines was made by the Alan Wood Steel Co.

In a joint brief, Jones & Laughlin, Pittsburgh Steel, Wheeling, American Rolling Mill and Weirton declared that the proposed increase in rates on ex-Lake ore is not only large in amount, carrying the rates above the previous all-time peak, but comes at a time when the steel industry is at low ebb. Increased charges for line haul service and dock handling on tonnage received by these companies in 1937 is computed to be approximately \$1,500,000 a year as follows:

J. & L., \$813,621.77; Pittsburgh Steel, \$156,705.63; Wheeling, \$331,497.60; American Rolling Mill, \$146,648.60; Weirton, \$174,750.48, a total of \$1,623,324.10.

It was pointed out that the first four named companies have in the aggregate had an average net profit in the past 10 years of approximately \$8,000,000, as follows: J. & L., \$4,306,451; Pittsburgh Steel, \$86,000 (loss); Wheeling, \$1,470,500; American Rolling Mill, \$2,256,549, a total of \$7,946,863. The ex-Lake ore increases in the aggregate for these four companies of \$1,448,473.62, it was declared, are thus equivalent to 18 per cent of the aggregate net profit.

Works Against Some Plants

These latest ex-Lake ore increases proposed are pointed to as an added burden on manufacturing costs to a geographical group of steel plants that have been constantly losing rank in the national total production. Whether regard is had to the immediate present or to any recent past or coming future period, it was stated, the proposed increase must work against the intervening companies and against their ability to maintain volume of operation.

"Necessarily the ex-Lake carriers are deprived of traffic and revenue in proportion as steel production at interior points diminishes," it was pointed out. "The weekly record of rate of production in the United States as a whole and in the Pittsburgh district for 1937 shows a precipitate descent from peak production in the earlier part of the year to depression level at the end of the year."

Starting with the week ended Jan. 4, 1937, it was explained, the United States total production rose from a rate of 55,000,000 tons, 79.4 per cent of capacity, to the year's high of 64,000,000 tons, 92.3 per cent of capacity, in April. From there it declined to a rate of 13,000,000 tons, 19.2 per cent of capacity at the week ended Dec. 27, it was stated. The Pittsburgh district production showed the same trend, it was pointed out: From a 12,000,000-ton rate of production, 79 per cent of capacity at the

WASHINGTON. — Submitted last Wednesday when arguments were completed, the application of the railroads for a 15 per cent increase in freight is now before the Interstate Commerce Commission for final determination.

Speculation now has turned to both the nature and time of the decision. It is, of course, only speculation for there is no way of knowing what the commission will do or when it will do it. The assumption is that it cannot know until it has studied the testimony placed before it for and against increases. The prevailing view is that, because of the showing made by the carriers of the urgent necessity of more revenue, they will be granted at least a substantial part of the increases sought.

There has been no challenge of the railroad position that the carriers must have more revenue, a position that has been echoed by the White House. But increases on given commodities nevertheless have been strongly opposed. Outstanding among such commodities are iron ore, coal, lum-

THE HEART OF THE DIESEL ENGINE IS GROUNDED on Heald Internals for ULTRA-PRECISION

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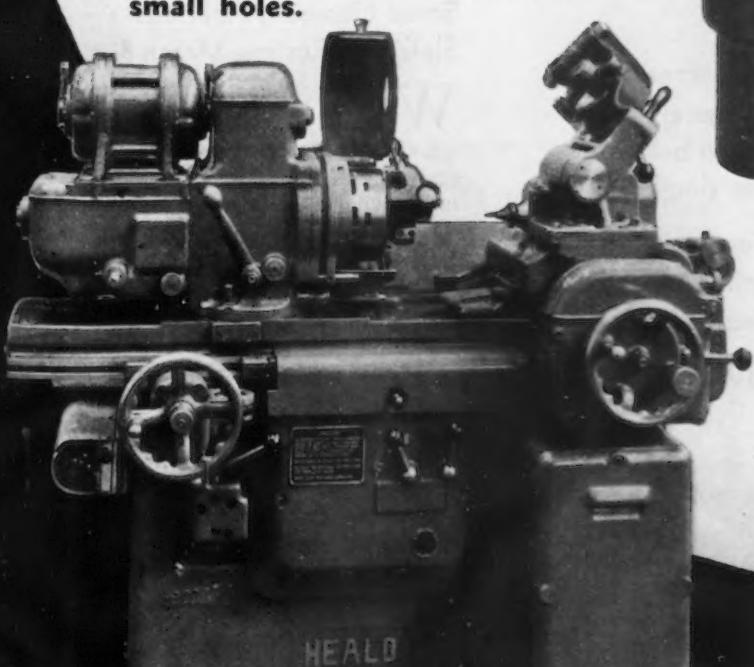
HE manufacturing of Diesel fuel injectors, the heart of a Diesel engine, is one of the most painstaking and important.

This is particularly true of the barrels and nozzles, the bores of which must be finished to the closest degree of accuracy in order to meet the requirements necessary to permit injection pressures up to as high as 20,000 lbs. per sq. in.

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DIESEL FUEL INJECTION NOZZLES Heald No. 81 Chuck Type Internals are used for grinding injection nozzles. Shown below is an installation for grinding a .2400" bore, a 58° seat and a .072" bore in the other end of the nozzle.

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beginning of the year to a high of 14,500,000 tons in May, 95 per cent of capacity; then to a low of less than 3,000,000 tons, 19 per cent of capacity at the end of the year. In 1932, the low point in the depression, it was stated, production in the United States was 13,681,000 tons. The rate last December approximated the 1932 low.

Losses Again Heavy

"In 1932 the steel industry's loss was \$100,000,000," it was declared. "From these facts the only deduction to be drawn is that the steel industry at present is in about as bad condi-

tion as in the worst year of the depression period, when its operations were unprofitable and losses were heavy."

The Standard Statistics Co. was quoted to show that 25 steel companies, large and small, netted an average profit of only 2.4 per cent on total invested capital in the 10-year period, 1927-36, inclusive. In the 10-year period, the most profitable year was 1929 when 9.2 per cent was earned.

To show how the steel production ratio has shifted from Pennsylvania to other areas, the protestants pointed out that in 1915, 49.3 per cent of the

total United States output of steel ingots and castings came from plants in Pennsylvania while by 1931 that State's proportion had dropped to 31.8 per cent. In no year since, it was stated, has it risen as high as 30 per cent. In 1935 it was given as 25.7 per cent.

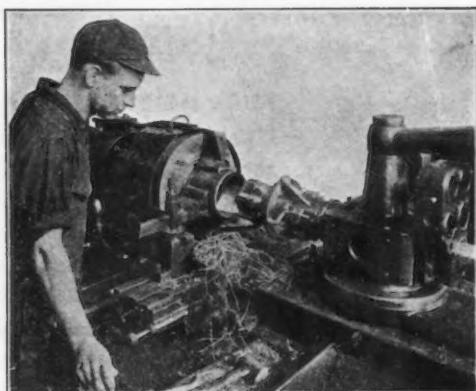
Notable increases in capacity, including construction of new steel producing units, were cited. The Chicago district reported capacity was said to have practically doubled from 1915 to 1935, from 7,328,240 tons to 13,929,600 tons. The Detroit-Toledo district was said to have increased its capacity from 26,650 tons in 1915 to 1,560,000 tons in 1937.

The protesting steel companies said no increase should be made on ex-Lake ore rates. It was pointed out that interior furnaces, unlike plants located at Lake Erie ports, are subject to ex-Lake rates in addition to rail charges from Northwestern mines to upper Lake ports.

The present and proposed line haul rates from lower Lake Erie ports to the interveners' plants and adjacent groups are:

To	Present	Proposed
Mahoning and Shenango Valleys	\$0.88	\$1.01
Midland (Aliquippa, Weirton)	1.05	1.205
Pittsburgh - Wheeling	1.21	1.39
Donora (Monessen, Pa.)	1.28	1.47
Johnstown, Pa.	1.36	1.565
Hamilton, Ohio	.96	1.10
Ashland, Ky.	1.31	1.52

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May we send you more information about LANDIS Collapsible Taps?

Scrap Licensing Hearings Slated To Resume March 8

WASHINGTON.—The Senate Military Affairs Committee announced last week that public hearings on pending scrap licensing legislation will be resumed on March 8.

A one-day session was held in July when representatives of independent steel companies interested in the bills and scrap institute spokesmen asked for additional time in which to prepare data for submission to the subcommittee.

Senator Thomas, Democrat, of Utah, subcommittee chairman, said that persons interested in the "strategic and critical" materials phase of the inquiry will be given an opportunity to be held some time after March 8.

LANDIS MACHINE CO., Inc.
WAYNESBORO, PENNA.



Distribution, Output Planning Bureau Proposed By Richberg

WASHINGTON.—Donald R. Richberg, former keeper of the Blue Eagle and White House adviser, recommended last week the creation of bureau of industrial economics under the Department of Commerce to provide machinery for "carrying out broad scale industrial planning for adequate production and distribution."

Mr. Richberg denied he was urging revival of the NRA and cited a recent book of which he is the author in substantiation of his claim that he opposes a return of the Blue Eagle floating over the country's factories and stores. As described by him, however, the program would shape up this way:

An administrator, possibly an Undersecretary of Commerce, would be named to head the new bureau established entirely separated from governmental agencies of prosecution and punishment;

Legal prohibitions of monopolistic or unfair practices would not be relaxed, but legislation would be necessary to clarify the law and assure freedom from criminal penalties and punishments for the cooperative efforts of business groups;

Study Trade Pacts

Trade agreements would be proposed by business groups and scrutinized by a special advisory committee and, if satisfactory, would be given approval of the administrator who would have the assistance of a policy making economic council. Continuing public supervision to protect the public interest would follow formal acceptance of a cooperative trade agreement.

"This may seem elaborate machinery with little driving power," Richberg added. "It is not strong-armed Government regulation. But the NRA showed us we have not yet determined our objectives or methods so as to insure general understanding and support, which is the essential basis for the exercise of any compulsion against even a vicious minority."

The former Recovery Administrator made no claims that his ideas had Administration support, but it was recalled that they are an elaboration of recent remarks made by the President about bringing production more into line with consumption by round-

table conferences with Government officials. And Mr. Richberg made no forecast as to how widespread acceptance would be in business circles. He said the first step would be to focus public opinion on the need for cooperation. Next in line, he explained, should come education cover-

ing the problems and practical methods of solution.

Finds Cooperation Needed

He took an indirect crack at Assistant Attorney-General Robert H. Jackson by pointing out that attacks on monopoly by ardent anti-monopoly enthusiasts are "simply attacks on big business."

"It certainly is not going to save the little man to use the anti-trust laws as the basis for preventing business men from cooperating. . . . Co-

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PACIFIC COAST REPRESENTATIVE, F. Somers Peterson Co., 57 California St., San Francisco, Cal.

operation offers the little man his only means of survival," Richberg asserted.

Referring to what he called "a dangerously, irresponsible economic system," Mr. Richberg expressed the view that the industrial system must be improved to eliminate "alternating booms and depressions" and continued unemployment.

"But we are never going to improve our condition, we are only going to make things worse, by destroying the ability of business men to do a better job and by trying to run a competitive system by political regulation."

Utilities Win 15¢ Slash In Coal Rate

WASHINGTON.—The Brooklyn Union Gas Co., the Consolidated Edison Co., of New York, and the Koppers Co., of New Jersey, have been successful in obtaining a temporary reduction in prices on low volatile coal from those fixed by the National Bituminous Coal Commission.

The commission allowed a reduc-

tion of 15c. per ton from the fixed f.o.b. mine price of \$2.15 on coal shipped by tidewater from West Virginia mines. The petitioners said that the question of whether to use coal or oil for making gas and by-products had been reduced to a critical margin by coal commission prices.

U. S. Hoffman Machinery Complaint Issued By FTC

WASHINGTON.—Charging violation of the Robinson-Patman Act, the Federal Trade Commission has issued a complaint against United States Hoffman Machinery Corp., 105 Fourth Avenue, New York, manufacturer and distributor of clothes pressing machines. The complaint alleges that the respondent corporation, since June 19, 1936, has been and is now discriminating in price among different purchasers of pressing machines of like grade and quality by giving and allowing certain purchasers different prices from those granted other purchasers.

NLRB Asks Court To Enforce Order

WASHINGTON.—The National Labor Relations Board has filed with the United States Circuit Court of Appeals in New York a petition asking enforcement of its cease and desist order issued in December against the Federal Bearings Co., Inc., and an affiliate, the Schatz Mfg. Co., Poughkeepsie, N. Y. The NLRB order of December directed the company to reinstate with back pay 14 employees allegedly discharged for union activities and to put an end to alleged interference with union activities of its workers.

Drydock Employees To Vote For, Against CIO

WASHINGTON.—Employees of the Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., will vote some time before Feb. 22 for their choice of union representation for collective bargaining purposes, the NLRB announced.

Workers can cast ballots for the CIO's Industrial Union of Marine and Shipbuilding Workers of America, for the A. F. of L.'s Metal Trades Council of Mobile, or for neither. The A. F. of L. council represents 11 A. F. of L. unions covering boilermakers, machinists, steamfitters, sheet metal workers, blacksmiths and others.

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Bids For Navy Steel Will Be Opened Feb. 21

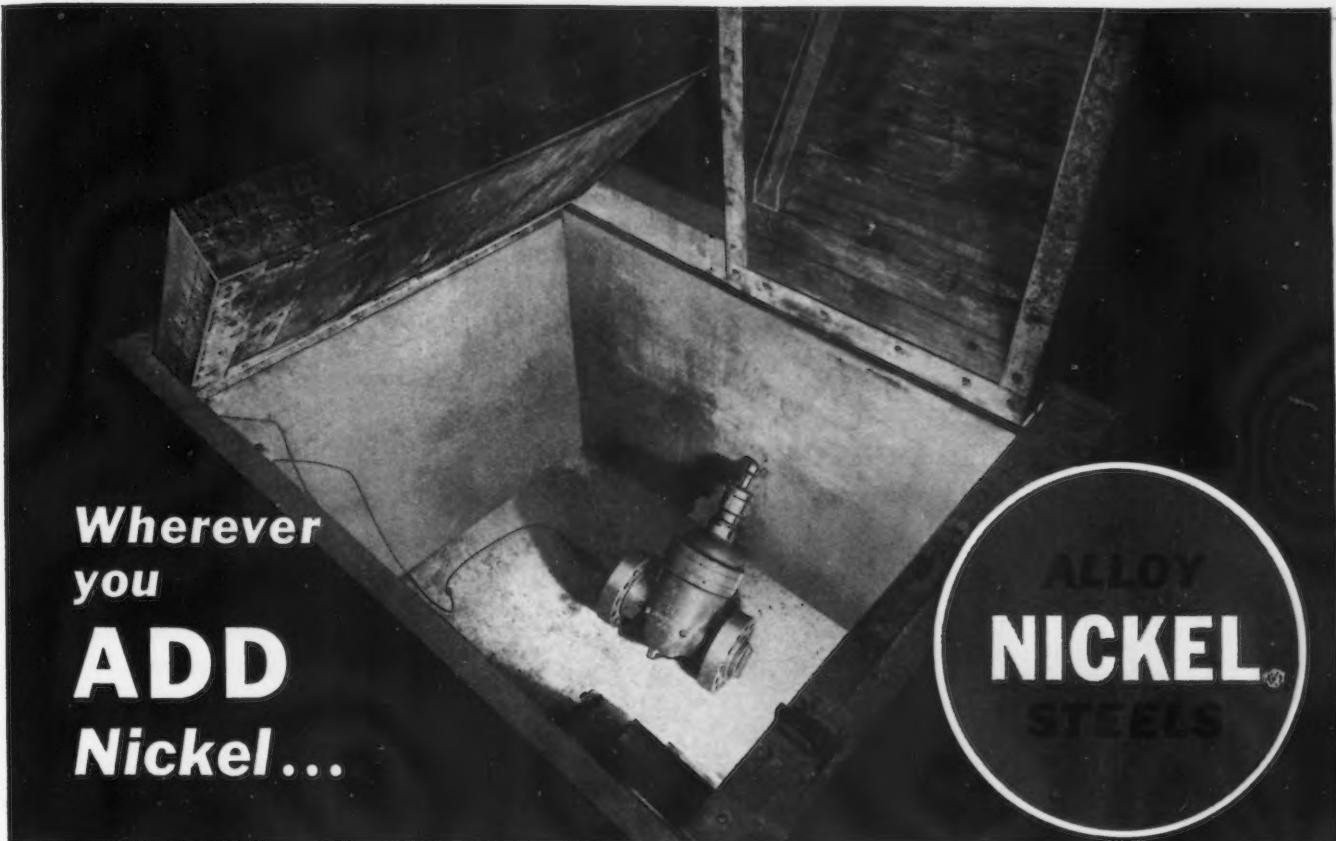
WASHINGTON.—The Bureau of Supplies and Accounts will open bids on Feb. 21 for 1110 tons of steel bars for stock at various navy yards and naval stations.

Navy Tin Award To Tuthill & Co., New York

WASHINGTON.—The Navy Department has awarded a contract for 20,600 lb. of grade A ingot tin to Tuthill & Co., New York, at 40.75c. per lb.

Ohio Brass Board Chairmanship Dropped

CLEVELAND.—The office of chairman of the board of the Ohio Brass Co., Mansfield, Ohio, has been abolished, according to a company announcement. Frank B. Black, company founder, was chairman from 1928 until his death last Dec. 19.



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...you quickly **SUBTRACT** from up-keep costs



Here is a story with a tinge of David and Goliath. A tiny wrench doing battle with a torsion machine to determine the load the former will bear before deformation. Note the steel rod which the wrench is gripping. When bolts were used instead of the rod, the heads were twisted off without the slightest effect on the wrench. Note also that this particular wrench is labeled "Nickel molybdenum" steel—the reason for its herculean strength.

Resting in the concrete "destruction" pit pictured above is a high-pressure valve of cast Nickel alloy steel. This is where the Hughes Tool Company of Houston, Texas, tests the strength capacity of valves that are used in the petroleum industry. This firm made its first 10,000 p.s.i. valve over a year ago and the metal selected for the job was cast Nickel alloy steel. The high pressure 10,000 p.s.i. valve illustrated held up to 28,500 p.s.i., nearly three times its specified capacity, in this "destruction" test.



Topsy-turvy, this picture showing a man suspended from a highly magnetized pulley merely through the attraction of the nails in his shoes. Up-keep costs are usually revolutionized whenever Nickel alloy steel parts are used. High costs come down because Nickel imparts added strength and toughness—greater resistance to breakage and wear. In this case it's the Nickel steel shaft running through the magnetized pulley that acts as the watchdog of the treasury. Destined to go into magnetic separator equipment made by Dings of Milwaukee, this shaft had to be of small diameter, yet capable of carrying unusually heavy loads. Nickel steel won the job because of its superior strength—in this particular instance 200,000 p.s.i. Our engineers will be glad to consult with you and to point out the many ways in which the Nickel alloy steels will save you money.

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.

. . PERSONALS . .

W. E. WHIPP, president of the Monarch Machine Tool Co., Sidney, Ohio, has been elected first vice-president of the National Machine Tool Builders' Association, Cleveland, succeeding N. A. WOODWORTH, formerly president of the Ex-Cell-O Corp., Detroit, who has resigned. PHIL HUBER, president of the Ex-Cell-O Corp., has been elected to serve as a director of

the tool builders' association to fill the vacancy created by the resignation of Mr. Woodworth.



VICTOR R. WILLOUGHBY, since 1924 general mechanical engineer of the American Car & Foundry Co., New York, has been made vice-president in charge of engineering of the company. He is being succeeded as general mechanical engineer by E. D. CAMPBELL, who has been assistant general

When you want the right steel at the right time for the right place, write WYCKOFF into your cold drawn steel specifications and you write your own guarantee of complete satisfaction.

WYCKOFF DRAWN STEEL COMPANY

General Offices: FIRST NATIONAL BANK BUILDING, PITTSBURGH, PA.

Mills at AMBRIDGE, PA. and CHICAGO, ILL.

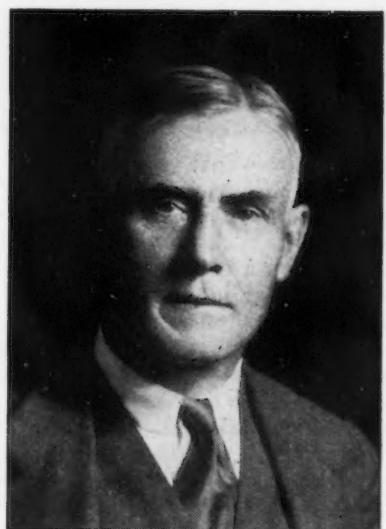
Manufacturers of . . . Carbon and Alloy Steels . . . Turned and Polished Shafting . . . Turned and Ground Shafting . . . Wide Flats up to 12" x 2". Warehouse stocks carried by nationally known distributors



W. E. WHIPP

mechanical engineer at the Berwick, Pa., plant. W. F. DIETRICHSON becomes assistant general mechanical engineer in charge of all engineering activities at the Berwick plant.

Soon after his graduation from the University of Michigan in 1896, Mr. Willoughby became identified with the Michigan Peninsular Car Co., one of the predecessors of the American Car & Foundry Co. From 1899 to 1919 he held various operating positions in the company's plants in the Mid-west. In September, 1919, he was transferred to the operating department in New York and in the following year was appointed assistant general



V. R. WILLOUGHBY



E. D. CAMPBELL

mechanical engineer and later general mechanical engineer.

Mr. Campbell served his apprenticeship in the steel car shops in the plant of the Car & Foundry company, after his graduation from Penn State College in 1907. For a while he worked in the engineering department of the company and was transferred to the St. Louis plant in 1909 to assist the chief mechanical engineer there. For two years from 1917 to 1919 he served in the Ordnance Department in Washington, and after his discharge from the Army he returned to the company

as assistant engineer in the New York office. From 1925 to 1933 he was stationed in St. Louis, where he helped to organize the mechanical department and was promoted to the post of assistant general mechanical engineer at the Berwick plant in 1933.

* * *

G. REED SCHREINER has been appointed advertising manager, Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Schreiner, who succeeds CHARLES R. MOFFATT, recently was appointed

director of advertising, United States Steel Corp. of Delaware, had been assistant advertising manager of Carnegie-Illinois since Oct. 1, 1935. He was graduated from the University of Pittsburgh in 1916 and entered the advertising department of the former Carnegie Steel Co. in 1919. He has served continuously in that department of the U. S. Steel subsidiary.

* * *

H. S. HERSEY, C. O. Bartlett & Snow Co., Cleveland, was elected



1938
TOOLS 1938
DETROIT, MICHIGAN
MACHINE
EXHIBITION

The latest in tools, processes, methods, equipment, and machines will be presented to industry in connection with the first annual membership convention of the American Society of Tool Engineers. Technical sessions will cover a wide variety of up-to-the-minute topics of vital interest to production men. Visits of inspection to all leading plants. Show and technical sessions open to non-members interested in industrial production.

Make your reservations now

BALTIMORE: J. H. Chandler, c/o Glenn L. Martin Co.
BRIDGEPORT: C. A. Dundore, 1178 Wells Place, Stratford
BUFFALO: Ben Buerk, 315 Grote St.
CHICAGO: Willard T. Wilson, 1026 S. Homan Ave.
CLEVELAND: C. V. Briner, 1433 E. 12th St.
DETROIT: Floyd W. Eaton, Burroughs Adding Machine Co.
HARTFORD: Frederic L. Woodcock, 56 Imlay St.
MILWAUKEE: Julius A. Riedl, 3965 N. 15th St.

NEW YORK: Ben C. Brosheer, c/o American Machinist
PHILADELPHIA: C. O. Hersam, Industrial Cons. Eng'g. Co.
PITTSBURGH: D. L. Shelly, Westinghouse Air Brake Co.
RACINE: Henry Springhorn, 1615 St. Clair St.
ROCHESTER: J. S. Bartek, Consolidated Mach. Tool Corp.
ROCKFORD: H. O. Olson, 1610 Seventh Ave.
TOLEDO: Lorence E. Rennell, 206 Crawford Ave.
TWIN CITIES: G. Wilden, 1408 Park Ave., Minneapolis

EXHIBITORS: Space still available. Allocations in order of receipt. For full details write or wire A.S.T.E., 5928 Second Blvd., Detroit.



G. R. SCHREINER

president of Foundry Equipment Manufacturers' Association at a recent meeting. P. J. POTTER, of Pangborn Corp., was elected vice-president. Mr. Potter and O. C. SABIN, of Steel Blast Abrasives Co., Cleveland, and H. S. Simpson, of National Engineering Co., were elected to board of directors to fill expiring vacancies.



R. F. HARRINGTON

R. F. HARRINGTON, who has been metallurgist for the Hunt-Spiller Mfg. Corp., Boston, for the past 15 years, has been appointed foundry superintendent and chief metallurgist. He has been in the employ of the company since his graduation from Tufts College in 1913. A. H. LINDSAY, who has been associated with the company for 32 years successively as a molder, molding foreman and as general foreman of foundry operations, has been made assistant foundry superintendent. JOSEPH GOOSTRAY, heretofore mechanical engineer for the company, has become mechanical superintendent in charge of maintenance and operation. He is being succeeded in his former post by H. E. BARBER. A. S. WRIGHT, formerly assistant metallurgist, has been appointed metallurgist succeeding Mr. Harrington in that capacity.

❖ ❖ ❖

JAMES R. BOTTOMS has accepted a position with Richard Thomas & Co., Ltd., Ebbw Vale, England, in connection with that company's new 56-in. hot and cold strip mill. He will be manager of the hot and cold finishing mill operations.

Before this appointment Mr. Bottoms was superintendent of the Jones & Laughlin Steel Corp.'s cold strip mill department. Starting his career with the American Rolling Mill Co. at Ashland, Ky., in 1923, he continued work at this plant until 1930 when he became superintendent of processing at the company's Butler, Pa., strip mill. He subsequently worked for Republic Steel Corp. in the metallurgical department and later at Wheeling Steel Co. as assistant superintendent of the cold strip mill department. He held the latter position until October, 1936, when he joined Jones & Laughlin.

❖ ❖ ❖

ALLEN W. MORTON has been elected vice-president, Koppers Co., Pittsburgh. He will continue in charge of Koppers American Hammered Piston Ring Division, Baltimore, where he has been general manager. Graduating from University of Virginia in 1916, he was employed by Bartlett Hayward Co., Baltimore, and later became associated with American Hammered.

❖ ❖ ❖

JAMES M. NELSON, superintendent of the open-hearths and bessemer furnaces at the Campbell plant of Youngstown Sheet & Tube Co., Youngstown, has retired from active service after spending 40 years in the steel industry. During his career Mr. Nelson held executive positions with the Algoma Steel Corp. of Canada and the Carnegie Steel Co. at Homestead, Pa. He went with the Youngstown Sheet & Tube Co., Dec. 31, 1925.

as a metallurgical tester, later becoming metallurgical superintendent and finally open hearth superintendent.

❖ ❖ ❖

FRANK F. FLAIG has retired as superintendent of the Parkersburg Iron & Steel Co., Parkersburg, W. Va. Mr. Flaig has been connected with this company since 1901.



A. W. MORTON

D. W. DROLL has joined the New York district sales office of Wheeling Steel Corp., Wheeling, W. Va., as a sales representative. He is a graduate of Leland Stanford University and was formerly with Westinghouse Electric & Mfg. Co. and more recently with Clayton Mark & Co., Chicago.

❖ ❖ ❖

C. V. GARDNER has been appointed district sales manager of Republic Steel Corp. in charge of the Seattle, Wash., office, succeeding C. D. WINTER, who has resigned. Mr. Gardner has been associated with Republic Steel since 1923, having been in charge of the office at St. Paul, Minn., from 1930 to 1937. A native of Chicago, he attended Carroll College at Waukesha, Wis., and was associated with the Canton Sheet Steel Co. for five years prior to joining Republic Iron & Steel Co. in 1923.

❖ ❖ ❖

J. H. HILLMAN, JR., and HENRY A. ROEMER have been elected directors of the Pittsburgh Steel Foundry Corp., Glassport, Pa., replacing F. W. SMITH and F. A. McCUNE, resigned.



J. R. BOTTOMS

C. D. CAREY has been appointed manager of railway sales for Gulf Oil Corp. and Gulf Refining Co., both of Pittsburgh, with headquarters in Pittsburgh. Mr. Carey has been handling this work for the past several years. He is a graduate of Princeton University and the Massachusetts Institute of Technology and has had wide experience in railroad work.

* * *

HENRY J. WALLACE has been appointed sales manager of the Pittsburgh sales office of National Tube Co., Pittsburgh, succeeding the late R. R. Jardine. He has been connected with National Tube for about 10 years and has been acting sales manager for the past several months.

* * *

J. K. B. HARE has been appointed central district manager, Westinghouse Electric & Mfg. Co., East Pittsburgh, succeeding JOHN ANDREWS, Jr., who joins the headquarters staff of the company as assistant to vice-president in charge of sales. Mr. Hare has been with Westinghouse since 1919 and was manager of the company's Buffalo sales office from 1935 to the time of his present appointment. From 1912 to 1919 he was connected with the Westinghouse Air Brake Co.

* * *

GEORGE A. HILEMAN has been appointed superintendent of maintenance, Carnegie-Illinois Steel Corp.'s Vandergrift, Pa., works. He formerly was assistant superintendent of maintenance. GEORGE S. ZORN, formerly general maintenance foreman, has been appointed assistant superintendent of maintenance. RUSSELL PENROD, boiler shop foreman, has been appointed general maintenance foreman. GLENN WHITE has been appointed boiler shop foreman and JOSEPH C. MCGRATH has been appointed assistant boiler shop foreman.

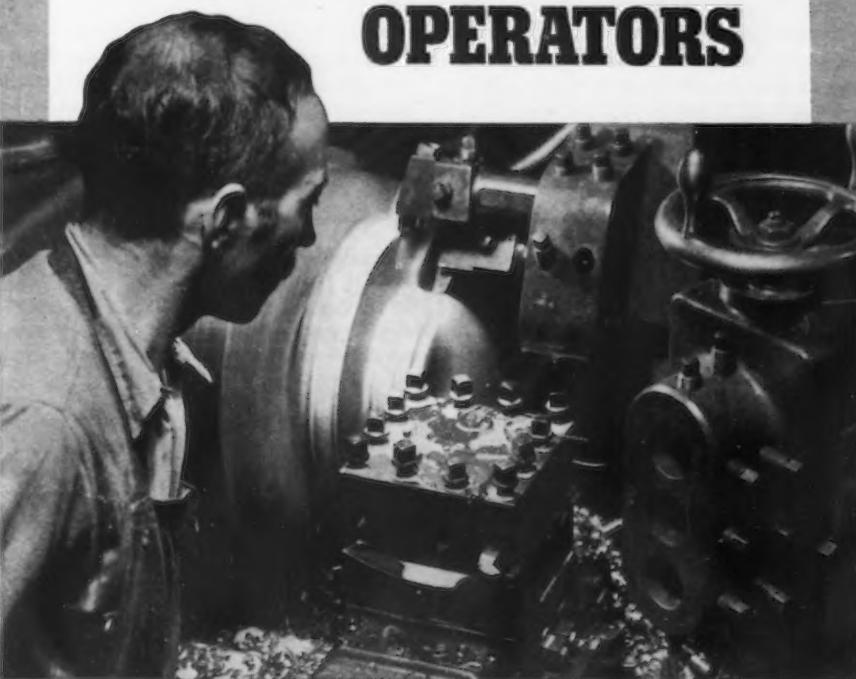
* * *

JOHN B. ROBBINS, formerly assistant secretary and treasurer, of A. M. Castle & Co., Chicago, has been elected a vice-president in charge of the Seattle branch. Mr. Robbins succeeds H. ERSKINE CAMPBELL, who will remain with the company in an advisory capacity.

* * *

VINCENT DRAYNE has been elected vice-president of Ketchum, MacLeod & Grove, Inc., Pittsburgh. Mr. Drayne has been connected with this advertising agency for the past 13 years in the capacity of account executive. Prior to that he was advertising manager of the Joseph Horne Co., Pitts-

AN ADVERTISEMENT TO TURRET LATHE OPERATORS



As a sensible man you know that out of the work you produce must come your wages, cost of materials (which includes wages of men who produced them), a share of plant costs, wages of a staff to sell what you produce, wages for the money that makes possible the plant in which you work.

Therefore, the more you produce in a day, the more valuable you become, the more secure your company and therefore the more secure your job.

You can produce only as much as your tools will let you. Unless your turret lathe is a new Warner & Swasey, you are being penalized—you are being held back from producing and earning as much as your skill would make possible. New Warner & Swaseys can help you turn out up to 50% more pieces a day, with less scrap loss, more accuracy, far less effort on your part.

In hundreds of plants the installation of new Warner & Swaseys has stepped up earnings for operators and the company—and has made possible lower prices which brought in more orders and so made more jobs. Everyone benefits with new Warner & Swaseys. Ask your foreman to call in a Warner & Swasey field engineer and find out what new equipment would do for you.

**WARNER
&
SWASEY**
Turret Lathes
Cleveland

burgh, following experience as a reporter and special writer with Pittsburgh newspapers.



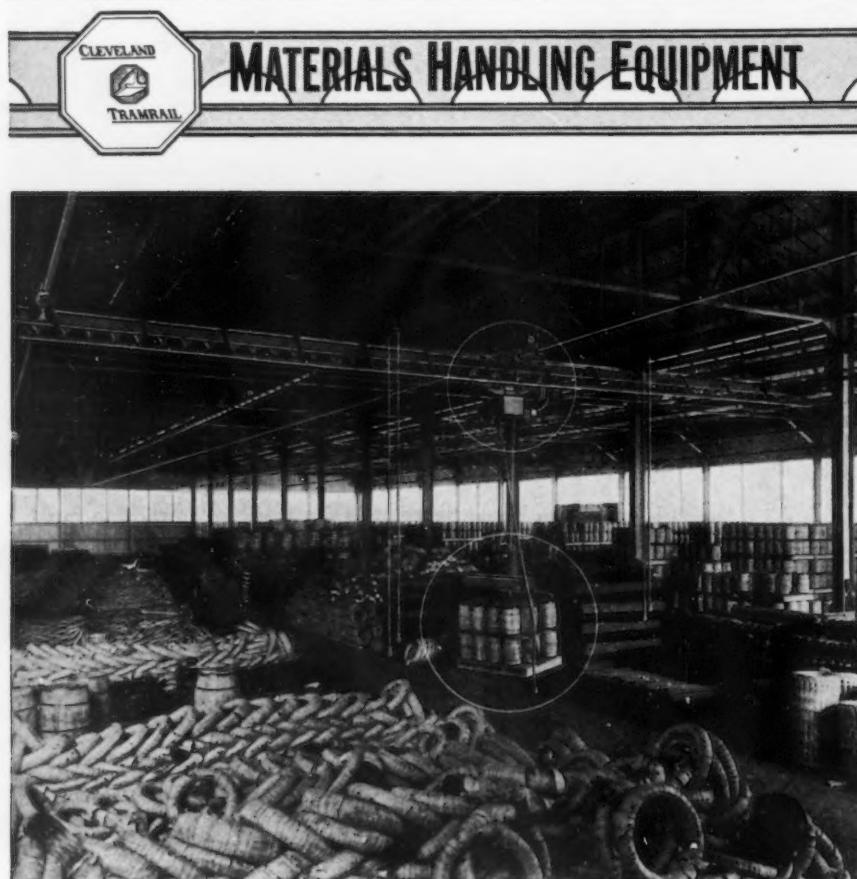
HARVEY B. BOWER has been elected vice-president in charge of the newly opened Milwaukee branch office of the Chicago-Latrobe Twist Drill Works, Chicago. He will make his headquarters at 910 North Fourth Street, Milwaukee. CLARENCE W. KRUEGER has been appointed to a similar post in Pittsburgh, at 20 Penn Avenue.

RICHARD FAULL, mechanical engineer of the ore mines and quarries division of the Tennessee Coal, Iron & Railroad Co., Birmingham, has been awarded a gold medal in recognition of 50 years of service with the United States Steel Corp.



H. L. HAMILTON, president, Electro-Motive Corp., La Grange, Ill., will address the Machine Tool Distributors of Chicago on Feb. 18 at the Lake Shore Athletic Club, Chicago.

LEON A. WATTS, who has been associated with the Allis-Chalmers Mfg. Co., Milwaukee, since 1903, has been appointed general superintendent of the company's service and erecting department, succeeding the late Samuel Moore.



● Another Tramrail Transfer Bridge installation—this one—48' span - 3 runway; all motions of bridge, carrier and hoist are motorized and floor controlled through push buttons and contactor panel.

ALSO BUILDERS OF



FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of
THE CLEVELAND CRANE & ENGINEERING CO.

1115 Depot St.
WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.



JOHN H. SCHROEDER, new traffic manager, Tennessee Coal, Iron & Railroad Co., and A. W. Carey, formerly traffic manager, who has retired. Outlines of their careers appeared in these columns recently.



FRED KOHNLE, president of the Monarch Marking System Co., Dayton, Ohio, has been made president of the Di-Mold Corp., formerly the Di-Mold Castings Co., Dayton. The com-

pany purchased all of the stock and assets of the Molded Alloys Co., Inc., of the same city. R. E. ENGLE is treasurer and general manager of the new company, and ROBERT N. LLOYD is secretary.

* * *

R. G. McELVEE, of the Vanadium Corp. of America, is to speak on "Ladle Additions to Cast Iron" at Waterloo, Iowa, at the February meeting of the Northern Iowa Foundrymen's Association, Feb. 22; at Black's Tea Room.



M. S. GEORGE

MOXIE S. GEORGE, heretofore district sales manager of the Milwaukee office of the Inland Steel Co., Chicago, has been appointed assistant manager of sales for the flat rolled steel division in Chicago, effective April 1. Formerly he was affiliated with the Moise Steel Co., Milwaukee, and with the American Rolling Mill Co., Middletown. FRANK K. CULLODEN has joined the sales staff of the Milwaukee office of Inland Steel Co.

* * *

P. B. BURTIS has been appointed manager of sales for the Bethlehem Steel Co. in the Philadelphia district, succeeding L. M. PARSONS, who has resigned, and C. M. MACKALL has been appointed assistant manager of sales at Philadelphia. Mr. Burtis has been engaged in sales work for the Bethlehem company for a number of years and became assistant manager of sales at Philadelphia two years ago. C. M. Mackall, who succeeds Mr.

Burtis, has been with Bethlehem for 12 years and goes to Philadelphia from the Detroit sales office.

* * *

HARRY S. BRADLEY, who for some years has been a director of the Shenango Furnace Co., Pittsburgh, has been elected a vice-president. He continues as president of the Shenango-Penn Mold Co. H. M. WILSON and FRANK E. SPENCER have been elected to the board of directors of the Snyder Mining Co. Mr. Wilson has

also been elected a vice-president of the Shenango-Penn Mold Co.

* * *

C. C. WOMACK has been appointed plant industrial engineer, Carnegie-Illinois Steel Corp.'s Irvin works. R. H. McBRIDE has been appointed assistant works auditor, Irvin works. E. A. DAVIS has been appointed plant industrial engineer of the company's Wood works and B. R. RICHARDS has been appointed works auditor of the Shenango works.



Through box car doors, the Baker Articulated Sheet Handler loads or unloads 10 ton packages of sheets up to 48" x 144". From any angle—time—labor—sheet damage—car damage—it saves money. And last year, realizing the savings, 4 mills installed these Baker Sheet Handlers. In one case actual savings reached 87% over former methods.

This is just one instance of the way the Baker Material Handling Engineer can help you save money. His broad experience, covering thousands of handling problems, is yours without cost. Get his estimate on savings possible in your own handling operations. Write today.



**BAKER INDUSTRIAL TRUCK DIVISION
OF THE BAKER-RAULANG COMPANY
2175 WEST 25TH STREET • CLEVELAND, OHIO**

... NEWS OF THE WEEK ...

Steel Ingot Capacity 71,065,540 Tons; Gain Of 1,900,000 Tons In 1937

ANNUAL capacity of the steel industry for producing pig iron and ferroalloys was increased during 1937 by 1,100,000 gross tons to an annual total of 50,698,400 tons per year, while annual capacity for producing steel ingots rose nearly 1,900,000 gross tons to a total of 71,065,540 tons, according to the American Iron and Steel Institute.

The increase during 1937 was the first to be recorded since 1933 for pig iron and ferroalloys and the first since 1934 in the case of steel ingots.

Last year, for the first time since 1929, the industry's capacity for producing bessemer steel showed a gain over the preceding year, the capacity at the year-end of 6,440,000 gross tons of bessemer ingots representing an increase of 115,000 tons over the year before.

Both open-hearth and electric furnace capacity likewise increased during the year. At the close of 1937, the industry's open-hearth furnace capacity was 63,524,356 gross tons per year, as against 61,965,862 gross tons at the end of 1936. Electric furnace

capacity was 1,092,604 gross tons, compared with 943,252 gross tons 12 months earlier.

Capacity for producing steel ingots by the crucible process declined by 2000 tons during 1937, amounting to 8580 gross tons annually as of Dec. 31, 1937.

Ayres Finds Rails Face Crisis In '38

CLEVELAND.—The many steel and railroad executives among the 1060 persons attending the annual Traffic Club of Cleveland banquet Feb. 10 heard Col. L. P. Ayres, Cleveland economist, assert that unless conditions soon improve a fundamental change in American transportation may result before the end of 1938.

If the affairs of the carriers become increasingly complicated, said Col. Ayres, the solution to their problems may be found among the following four plans: Government ownership, compulsory consolidation into a

limited number of systems, reorganization by new bankruptcy legislation, or the pooling of earnings to pay deficits of the poorer roads.

"If there could be a treaty of peace between the utilities and the Government, more than a billion dollars' worth a year of new construction could promptly get under way," he continued. "The railroads would have greatly increased traffic; the iron and steel industry would be prosperous, and the automobile industry would prosper also."

C. M. White, vice-president, Republic Steel Corp., Cleveland, was toastmaster at the annual banquet.

International Harvester Workers To Vote On CIO

CHICAGO.—The National Labor Relations Board will hold an election within two weeks to determine the collective bargaining unit of the nearly 7000 employees at the Chicago tractor works of the International Harvester Co.

The election was requested by the Farm Equipment Workers Association, a CIO division. An independent union known as the Mutual Association also operates in the plant.

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ROLLING ON THE RIGHT TRACK



As the Limited rolls in, through a maze of switch points and signals, there is rarely a thought given to the men in charge of levers and lives. Likewise, users of Morgan Continuous Rolling Mills take dependability for granted. Uninterrupted service, year after year, has established railroad regularity in their production schedules. Behind this service, however, is over half a century of Morgan engineering development, plus an endless capacity for perfecting the details.

Overlooking the big railroad yards sit men surrounded by levers and telephones. They govern the movements of every piece of rolling stock. It is their experienced judgment and skilful handling of details that make these steel networks function as smoothly coordinated units.



**MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS, U. S. A.**

R35



U. S. Steel Or Union Can Drop Wage Agreement In 20 Days

A WAGE contract similar to an agreement already in effect was signed Feb. 9 by officials of United States Steel Corp. subsidiaries and the Steel Workers Organizing Committee.

However, the new contract termi-

nates automatically if the union and steel company are unable to reach agreement within 20 days on changes proposed by either side in the 1937 contract. Other features of the new steel agreement are:

1—The open shop policy is main-

tained in all corporation plants.

2—The SWOC, as heretofore, is recognized as bargaining agent only for its own members who are corporation employees.

3—Employees continue to have the right to join or not to join a labor organization, free from interference or coercion.

4—Present wages, including the \$5 minimum, the 40-hr. week, seniority rights and other points covered in the 1937 agreement, will continue indefinitely.

The text in the Carnegie-Illinois Steel Corp. extension agreement providing for quick changes in the present union contract if business warrants says:

"The 1937 agreements shall continue until changed or terminated as follows:

"(a) Either party may, subsequent to Feb. 28, 1938, at any time and from time to time, give ten days' written notice to the other party of the time for the commencement of a conference of the parties for the purpose of negotiating the terms and conditions of a change of the 1937 agreements, which conference shall be at the office of the corporation in Pittsburgh, Pa., unless otherwise mutually agreed and

"(b) If, because of a failure to agree, the 1937 agreements are not changed by a written agreement entered into by the corporation and the union within 20 days from the giving of said notice, then the 1937 agreements and all of the provisions thereof, shall terminate upon the expiration of 20 days from the giving of said notice. . . ."

Some other steel producing and processing companies, which followed United States Steel's lead last year in signing SWOC contracts, are expected to make new union agreements. Timken Roller Bearing Co., Canton, Ohio, has extended its present wage contract which expires Feb. 28 by 90 days.

John L. Lewis, CIO chieftain, described his satisfaction with the new United States Steel agreement thus:

"The steel agreement is a triumph for moderation and sound business judgment at this time. It preserves the current wage structure and standards; it maintains the buying power of labor except as curtailed by shrunken work opportunity; it gives leadership to the confused and bewildered in business because it charts a definite course which all industry will do well to follow."

SUPER-SERVICE RADIALS



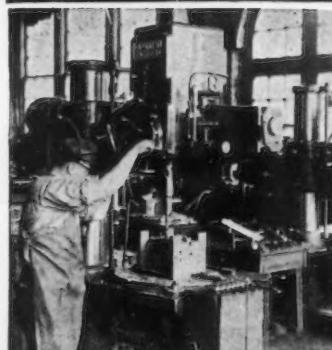
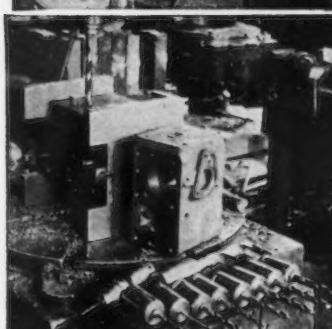
The First Three Led To 12 More High-Speed Super-Service Radials

• These views show a few of the 15 High-Speed, All-Gear Super-Service Radials recently installed by a nationally-known manufacturer, whose work includes a variety of jobs like the one shown in the center photograph. Operations in sequence are as follows: Drilling — six $9/16''$, seven $13/32''$, and $7/16''$, one $3/8''$, one $15/16''$, one $29/64''$, one $21/64''$, one $3/16''$, one $1/2''$, one $1/4''$, two $1/8''$ —23 HOLES PER PIECE IN ELEVEN DIFFERENT SIZES.

In addition, eight holes are tapped. Ability to change over quickly in order to handle a wide range of hole sizes economically on Super-Service Radials makes their use particularly advantageous. Their speed and ease of handling will inspire your operators.

Ask our engineers to show you all the benefits of these modern machines.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY, CINCINNATI, OHIO



CINCINNATI BICKFORD

Green Joins Industry In Fight To Revise Profits, Gains Taxes

REPEAL or modification of the undistributed profits and capital gains taxes as a step to restore confidence is proposed by the American Federation of Labor's executive council.

Lining up with foes of those taxes, the AFL body said that labor, industry and the Government must pull together "in order to break down and overcome a most serious and threatening unemployment situation" and declared:

"As a step toward the restoration of public confidence on the part of those who allege they are inspired by fear and distrust, the executive council of the American Federation of Labor suggests that Congress repeal or modify the undivided profits and capital gains taxes."

No Government Dictation

"Time would prove both the wisdom and soundness of such action. Furthermore, such action on the part of Congress would answer the demand of business for some concrete evidence on the part of the Government to supply a form of relief which they assert is so urgently needed."

Later business leaders hailed an address at Chicago by William Green, AFL president, in which Mr. Green declared labor recognized that, for the good of workers, business must be allowed to operate without dictation from the Government.

Says Railroad Buying Would Revive Trade

A. C. MOORE, president Chicago Railway Equipment Co., in reporting 1937 net earnings of \$681,342.23, the best showing in 14 years, said: "A revival of railway purchasing would lend valuable assistance to reviving industrial activity; it would at the same time effect a major division of our business. Its advent will be governed largely by two factors—the trend of traffic, and the outcome of the pending rate case. That substantially higher rates will be authorized, and promptly, seems to be open to no doubt. If traffic rises materially, there

will be a definite need for new equipment.

"Over a period of years, rolling stock has declined at a faster pace than new equipment was installed, last year being no exception. For instance, although approximately 75,000 new freight cars were put into service during 1937, over 90,000 were retired,

there being a small net loss in carrying capacity for the year. Both for the sake of economical operation, and to render adequate service, the railroads should replace much of their present equipment. It is well within the probabilities, as the head of one of our prominent railroads recently stated to the I.C.C., that the railways may expend \$300,000,000 annually on new freight cars for the next 20 years, provided that adequate net earnings permit them to restore and stabilize their credit."



Why does Ford Motor Co. buy Brownings? Just bought two more of these Brownings. Now has 40 in service.



THE BROWNING CRANE & SHOVEL CO.

ESTABLISHED 1899

Main Office and Factory:
16226 WATERLOO RD., CLEVELAND, O.

Export Department:
30 CHURCH ST., NEW YORK, N. Y.



U. S. Needs Pledge American System Will Stay, Weir Says

A "PLAIN, unequivocal" statement by the Government that the proved basic principles of the American system of private enterprise shall be continued is America's most important need, Ernest T. Weir, chairman of National Steel Corp., believes.

There are, said Mr. Weir in a radio address Feb. 11, a number of "glaring obstacles" which at this time bar the way to a genuine forward movement of business, increased production of goods and services, the creation of jobs and greater national income. He said:

"Business men believe that if these obstacles are removed or diminished, at least a start will be made toward solid recovery. The all-important fact is that good business means jobs, higher payrolls, greater production . . . in short, what is good for business is good for you as an individual and for our whole people."

Dispel Doubt

"The specter of Government competition and planned economy raises doubts in the minds of many as to whether this tried and proven system will be so drastically changed that it cannot function.

"This shadow of doubt could be dispelled by a plain, unequivocal statement by Government that the proven basic principles of the American system of private enterprise shall be continued, that they shall be encouraged, not condemned.

"Of course the public interest should be protected by law; of course, state and Federal Government should exercise those regulations necessary to prevent abuses. But with such regulation must come assurance that the fundamentals of the system under which we operate will not be junked.

"We must not wreck the whole machine to adjust some minor imperfection; we must not burn down the barn to catch a rat."

A RECORD

For 138-55" and 65" Ohio Magnets sold since the present design was introduced NOT ONE outer ring has been sold.

They do not break



The 55" Ohio Magnet shown above averages 1275 # of sheet stamping scrap per lift. The number of lifts is counted to determine when the car is loaded to capacity.

**The Ohio Electric Mfg. Co.
5908 Maurice Ave. • Cleveland, Ohio**

Tributes Offered To Inventors In Steel

CLEVELAND.—Tributes to four inventors, three of whom made valuable contributions toward progress in the iron and steel industry, were presented at a luncheon by the Cleveland Chamber of Commerce, Feb. 11, signalizing National Inventors' Day.

Samuel T. Wellman, pioneer in the construction of acid and basic open hearths and the open-hearth charging machine; Alexander E. Brown, whose machines helped revolutionize the handling of ore, coal and limestone; and George H. Hulett, inventor of the Hulett unloader, were honored, with Charles F. Brush, inventor of the arc lamp.

Waldemar B. Kaempffert, science editor, *New York Times*, was the principal speaker.

World Arms Race Menace to Price Stabilization

LONDON (By Mail).—Sir William Firth, chairman of Richard Thomas & Co., the great British tin-plate concern, addressing a gathering of Scottish steel men in Glasgow recently, described the world armaments program as a menace to stabilized prices in the steel industry, resulting in the erection of surplus steel production capacity throughout the world.

"Productive capacity can expand much faster than demand," declared Sir William. "Overproduction must lead either to cut-throat competition or to the continuation of international cartel arrangements, supported by a planned industry, involving contributory pension schemes and a shorter working week in times of poor demand."

Inclusion Rating For Perrin Process

R. PERRIN, author of the article "Rapid Refining of Steel," published in THE IRON AGE, Oct. 14, 1937, has pointed out an error in the paragraph on rating of inclusions. On page 142, it is stated that "one division equals 0.176 mm.," whereas the measurement should be 0.0176 mm.

Mr. Perrin would like to add, also, that when examining inclusions, "in the case of grouped inclusions, such as alumina grapes, the length of the inclusion is measured on the total length of the grape, the whole grape being considered as one single inclusion."

European Market To Be Reorganized

LONDON (By Mail).—According to the French "Agence Economique," there will shortly be a reorganization of the market for semi-produced goods, under which the requests of all buyers received by the various groups would be forwarded to Cosibel (the Belgian iron and steel bureau), which would centralize orders.

Under this reorganization plan pools

would be established for the principal export markets—Japan, Italy and Rumania—and a period of reference would be determined on the basis of which quotas would be allotted for each producing country.

It is pointed out in French steel circles that the European cartel's recent price reductions simply "legalize" the de facto situation. The question whether they will be remunerative, however, depends on the index of activity of the mills, and in this connec-

tion it is added that the December production was below the 1936 average. Nevertheless, no pessimistic view is taken, as it is considered that latent needs will make themselves felt by the spring.

Hope is expressed that M. Dieudonne, the cartel representative now in New York conferring with American producers, will succeed in reaching an agreement defining and extending the Dusseldorf "gentlemen's agreement" on export prices.



METAL SPHERES WITH LAPPED SURFACES

Strom Steel Balls possess that extra measure of quality by means of which the ultimate in ball bearing performance is achieved.

This special lapping practice is exclusive with Strom.

Physical soundness—correct hardness—size accuracy and sphericity are guaranteed in all Strom Balls.

Other types of balls—STAINLESS STEEL—MONEL—BRASS & BRONZE—are also available in all standard sizes. Write for full details.

Strom STEEL BALL CO.
1850 So. 54th Avenue, Cicero, Ill.

The largest independent and exclusive Metal Ball Manufacturer

...OBITUARY...

CHARLES ELI GREEN, former president of the American Can Co., died Feb. 10 at his home in Cranford, N. J., after a prolonged illness. He was 64 years of age. Mr. Green entered the New York office of the American Can Co. at the time of its formation in 1901, from the American Steel Hoop Co., where he was assistant auditor. In 1907 he was raised to the position of auditor of the American Can Co.,

which he held until 1926. In that year he became a member of the board of directors of the company and comptroller. Six years later, in 1932, he became a vice-president, and in 1936, president. He had held this position for only a short time when he was forced to retire because of ill health.

* * *

LOUIS D. ROUND, owner of D. Round & Son, Cleveland, chain hoist manufacturers, died Feb. 9 at Orlando, Fla., from injuries received in a fall.

He was 71. He was president of several chain manufacturing company concerns, including Cleveland Chain & Mfg. Co. of Bridgeport, Conn., the Seattle Chain & Mfg. Co., of Seattle, and the Round-California Chain Corp., Ltd., of San Francisco.

* * *

CLARENCE O. GLEGHORN, formerly with the Detroit office of the B. F. Goodrich Co. and more recently director of manufacturer's sales in the Chicago area for that firm, died Feb. 9 in Harper Hospital, Detroit, of pneumonia. Mr. Gleghorn, who was born in Clinton, Ohio, was 60 years old.

* * *

ARTHUR G. JUDSON, 56 years old, secretary of the Economy Baler Co., died Feb. 7 at Ann Arbor, Mich.

* * *

ANDERS W. KJELLBERG, former engineer with the Cadillac Motor Co.,



A 2 to 1 FAVORITE *In The Automotive Industry*

● Automobile manufacturers are most exacting in their requirements for all production machinery... and especially so of forging equipment. Of their forging machines they demand fast, accurate, uninterrupted production.

Ajax Forging Machines with patented air clutch have met these demands most satisfactorily... that's why at least two out of every three forging machines purchased for automobile production since Ajax introduced the air clutch are Ajax built. These machines are working day and night forging transmission gears, universal joints, flanged drive shafts, steering gear sectors, valves, etc. to meet heavy production schedules.

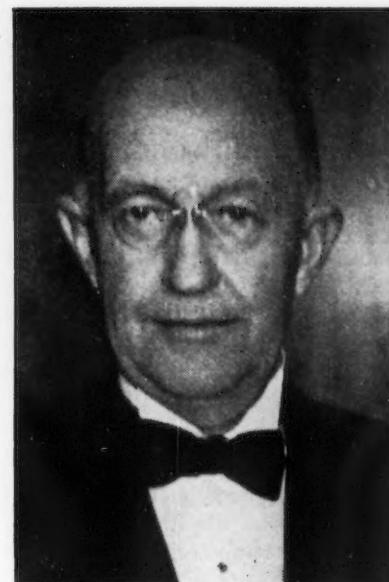
The experience of automobile builders shows that any manufacturer with forging machine requirements can profit to the utmost by using Ajax Air Clutch Forging Machines.

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THE AJAX MANUFACTURING COMPANY

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C. E. GREEN

died Feb. 8 at Rochester, Mich. Mr. Kjellberg was born in Sweden and educated at Upsala University.

* * *

JAMES G. MCGRATH, 59 years old, assistant to the president of the Gale Mfg. Co. for the last three years, died Feb. 10 at Albion, Mich. A native of Albany, N. Y., Mr. McGrath at one time taught mathematics in New York State Public schools. He was an official of the Detroit Valve & Foundry Co. prior to 1933, when he joined the State purchasing department as a buyer. He became connected with the Gale company when

B. J. Abbott, secretary of the State Administrative Board under Gov. William A. Comstock, became president of the Gale company and asked Mr. McGrath to assist him.

* * *

MINER SPAULDING KEELER, chairman of the board of Keeler Brass Co., Grand Rapids, and one of its founders, died of heart disease Feb. 9 at St. Petersburg, Fla. Mr. Keeler was a member of the State Senate in 1895 and 1896 and was a director of the Old Kent Bank & Michigan Trust Co. He was 75 years old.

* * *

HENRY R. FISHEL, retired head of the Fishel & Marks Co., Cleveland, iron and steel broker, died Feb. 10 in Cleveland. He was 79 years old.

* * *

J. S. PERKINS, former Wooster, Ohio, structural steel fabricator, died Feb. 10 in Florida where he was spending the winter. He was 71 years old.

* * *

JAMES T. MADIGAN, employment manager, Elwell-Parker Electric Co., Cleveland, died Feb. 11 in Cleveland after an automobile accident at the age of 65.

* * *

JAMES A. SIVALLS, former Woodville, Ohio, manufacturer of oil tanks and equipment, died Feb. 10 at his home in Bartlettsville, Okla. He was 72 years old.

* * *

DR. KAREL LOEVENSTEIN, chairman of the Skoda works, Czechoslovakia's greatest armament enterprise, died early in February at Prague, aged 52 years.

* * *

FRANK H. GINN, Cleveland attorney and director of many corporations, died suddenly Feb. 6 in Cleveland. Among the corporations with which he was connected were Midland Steel Products Co., Murray Ohio Mfg. Co., Otis Steel Co., and Electric Controller & Mfg. Co., all of Cleveland.

* * *

FRANCIS CHARLES McMATH, a noted astronomer and for years one of Detroit's leading industrialists, died Feb. 13 in Henry Ford Hospital from a heart ailment. Born at St. Louis, Jan. 29, 1867, Mr. McMath received an engineering degree in 1887 from Washington University at St. Louis. In that year he started as a draftsman with the Detroit Bridge & Iron Works, becoming engineer of the firm 12 years later. In 1900 he resigned to organize the Canadian Bridge Co. at

Windsor, Ont., holding the office of president until 1921 when he became a director. From 1911 to 1919 he was consulting engineer and director for the St. Lawrence Bridge Co., Ltd., which built the great cantilever bridge across the St. Lawrence River near Quebec. Mr. McMath directed construction of numerous important railroad bridges, many in Canada. In 1906 he helped form the Essex Terminal Railroad at Windsor and was its president until 1921. Retiring from

active business 15 years ago he centered his attention on astronomy and developed a successful method of taking moving pictures of heavenly bodies. With his son, Robert R., and Judge Henry S. Hulbert, he founded the McMath-Hulbert Observatory of the University of Michigan at Lake Angelus, near Pontiac, Mich. His son, Robert R., is president of Motors Metal Mfg. Co., Detroit, another son, Neil C. is vice-president of Whitehead & Kales, Detroit.



Said a Plant Superin- tendent—

"I'll say this about Wyandotte Metal Cleaners..."

"They don't go dead on you when you turn your back. That means a lot on a production line."

Such an expression means even more to us at Wyandotte, where the purpose is always to supply metal cleaners which can be depended on, each one to do its job completely and economically. Ease of control is a characteristic which makes life easier for the Superintendent and his helpers.

May we co-operate with you, too?

Wyandotte



**ANSWER THESE,
MR. CHAIRMAN!**



"What would happen to our prospective profits on orders that we would be unable to complete if we had a fire?

"Would we use our surplus to pay interest and taxes after a fire?

"Would we have to discharge our 'key men' until the plant was rebuilt?

"What would we tell our stockholders if they discovered that all this was due to your negligence in not securing Prospective Earnings Insurance?"

THE AMERICAN INSURANCE CO.

AND ITS AFFILIATES

The Columbia Fire Insurance Company

Dixie Fire Insurance Company

THE AMERICAN INSURANCE CO.

15 Washington St., Newark, N. J. (Dept. 0812)

Gentlemen: Please send me, without cost or obligation, complete information regarding insurance protection for prospective earnings. I am interested to know the relatively low cost for insurance of company profits and unavoidable expenses.

Name of Company _____

Your Name _____

Address _____

City _____ State _____



Rear view of completed steel house.

First City Of Steel Houses Planned For U. S. Steel Corp.

TWO steps which eventually may hasten the placing of steel houses on America's farms and in its industrial centers were taken this past week by subsidiaries of United States Steel Corp.

At Pittsburgh Carnegie-Illinois Steel Corp. granted an option for purchase of land on which 500 all-steel houses are to be built by Gilbert & Varker, Inc., engineering firm of Philadelphia and Boston.

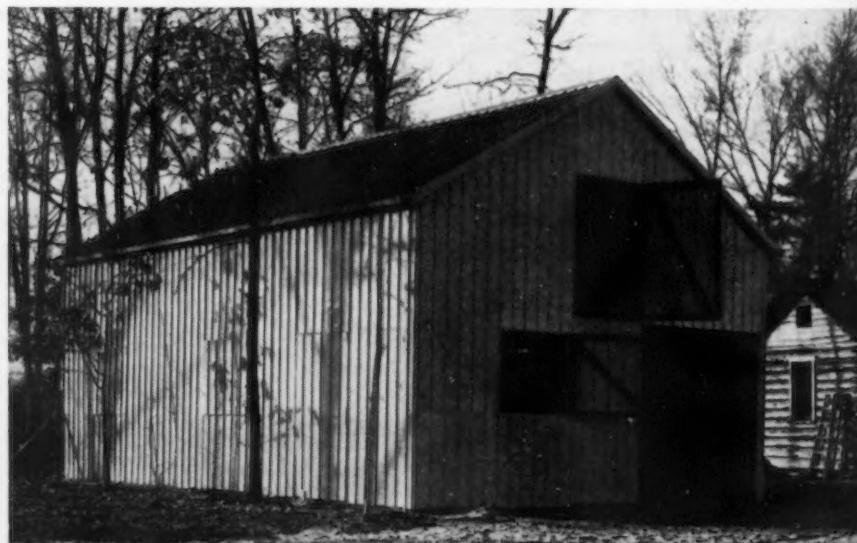
Homes for employees at Carnegie-Illinois' new Irvin works, Clairton, Pa., are to be erected by the engineering company, a project which some ob-

servers see developing into the world's first "city of steel."

Almost simultaneously, Tennessee Coal, Iron & Railroad Co., Birmingham, completed erection of five-unit all-steel prefabricated farm buildings at Washington with the expectation that the buildings, including a five-room house, barn, poultry house and smoke shed, will be available unassembled at the site for around \$2,000.

Large Outlets For Steel

This small-size farm has been erected in suburban Washington by Tennessee Coal, Iron & Railroad,



The Barn.

whose engineers designed the units in cooperation with the Farm Security Administration, formerly the Resettlement Administration.

Both the farm and industrial center steel house projects are considered significant to industry as potential outlets for steel, particularly for products of the large continuous sheet and strip mills.

No starting date for construction of steel homes near the Carnegie-Illinois Irvin plant has been set. A company statement said:



The Smokehouse.

"Gilbert & Varker anticipates that the construction of these houses will demonstrate the practicability of using steel in considerable quantities in small homes, and that the economies possible in mass production and mass erection of all-steel homes will be realized."

"Sample" farm buildings set up by the Tennessee company are part of the FSA's program for developing inexpensive but adequate dwellings for low-income farm families under the Bankhead farm tenancy program enacted by Congress last session. Constructed on Government-owned land in the farming area near Greenbelt, Md., home of the FSA's celebrated low-cost housing community, the modern version of the old farm homestead will serve for demonstration work in home economics and agricultural courses in the Greenbelt High School.

More than 200 spectators were on hand for the opening with Robert Gregg, president of the Tennessee Coal, Iron & Railroad Co., U. S. Steel Corp. officials and Government housing experts in attendance. Mr. Gregg explained that the structures are not patented in any way and the design is simplified to the greatest possible degree in order that any sheet metal fabricating plant can produce the buildings.

Designed to keep both initial and



The tire building department in Dunlop's Buffalo plant showing the main lighting installation with 500-watt G-E Silvered Bowl MAZDA lamps.

DUNLOP TIRE AND RUBBER CORP. PLANT STARTS LIGHT CONDITIONING

The Dunlop Tire & Rubber Corporation in Buffalo recently light conditioned its tire building department, using 500-watt G-E Silvered Bowl MAZDA lamps. The new lighting provides four to five times more light than the old system and gives employees the right kind of lighting for Seeing and Comfort . . . wherever eyes are used.

Important to the success of any relighting program is the use of good lamp bulbs . . . such as G-E MAZDA lamps, the kind that *Stay Brighter Longer* and give full lighting value for your money. Next time you buy lamp bulbs, follow the example of thousands of purchasing agents . . . the men who buy bulbs for the outstanding industrial and commercial concerns, great railroad systems, and public utilities . . . and specify G-E MAZDA lamps. General Electric Company, Dept. 166, Nela Park, Cleveland, O.



USE A G-E LIGHT METER TO MEASURE PLANT LIGHTING

The General Electric Light Meter measures light as simply as a thermometer measures temperature. It tells whether the various departments in your plant are getting enough light for safe seeing. Order one today. Costs only \$11.50.

GENERAL ELECTRIC
MAZDA LAMPS



LAMPS WITH THIS MARK
STAY BRIGHTER LONGER

G-E Silvered Bowl MAZDA lamps are regular MAZDA lamps with a coating of "mirror" silver on the bowl.

maintenance costs at a minimum, the farm buildings are built up of prefabricated panels of V-crimp light gage, galvanized copper-bearing steel, welded to light cold-rolled steel structural members. All buildings are designed for the same standard panel construction but barn panels run in 12-ft. lengths; house panels in 9-ft. lengths—providing 8-ft. ceilings.

Thorough flexibility, a requirement stressed by the FSA plans, is met by

the standard panel method of construction, permitting the farmer to increase the size of buildings as his needs warrant. Additional rooms are added with little difficulty by utilizing the panels of 4-ft. widths and adding to the size of rooms in multiples of four.

The barn, believed to be one of the few all-steel barns ever constructed, will house 12 tons of hay, 500 bushels of corn and still leave room for two mules and two cows. The poultry house is estimated to have a 50-fowl

capacity, in its 10 x 12-ft. interior.

Company engineers described the buildings as "fire-proof, lightning-proof, vermin-proof and termite-proof"; sealed from the weather by the overlapping crimps; and anchored for windstorm protection by using a large number of steel foundation piers. These also are prefabricated and consist of steel footing plates, each shop-welded to two hot-rolled channel sections.

Wood floors are laid on steel joists; partitions in the house are covered with wall-board for interior finishing; the heating system comprises an all-steel fireplace of the air-circulating type and is designed to heat the entire five-room house.

Because of the completeness of prefabrication, the family and livestock can move in within three weeks from the time the construction is started, if the farmer has the help of a few neighbors. The erection process is simple and merely requires the use of stove bolts in joining the pre-formed panels together. Steel window sashes and built-up flush type doors are delivered already installed in their panels, further reducing construction costs and saving time.

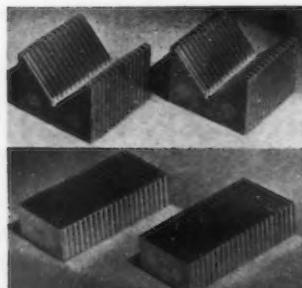
Under the farm tenancy act, the FSA is empowered to make direct loans for farm building construction at a 3 per cent interest rate, payable over a 40-year period. Company officials feel that because of the low-cost feature of the prefabricated steel buildings—a requirement which has admittedly been difficult to meet in any other type of building—they may have an exclusive field.

FSA officials expressed themselves as well pleased with the completed structures and indicate the design may go a long way toward solving the housing problem of farm tenants, particularly in the South.

T-P

5-STAR NEWS REVIEW

In 1937, the products shown here were introduced under the T-P trade-mark and guarantee. They present important opportunities to simplify and expedite production and inspection . . . as well as to establish new limits of accuracy. Full information on any or all of them for the asking. Write.

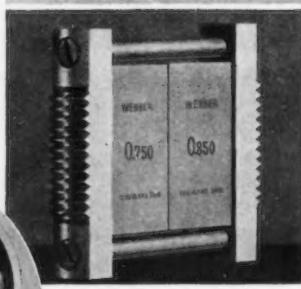


Magnetic Parallels and V-Blocks widen range of set-up of Taft-Peirce Superpower Magnetic Chucks. Universal in application.



Sine Blocks combine the features of a 5" sine bar and a right angle iron. Top surface ground parallel within .000" to center line of sine plugs.

Adjustable Thread Snap Gage has a true form of thread ground in faces of anvils . . . an exclusive feature. Anvils furnished for any pitch, any percentage of thread engagement.



Webber Gage Blocks in low-cost sets guaranteed equal or superior to any blocks made to Class B tolerances.

Threaded Setting Blocks. Used with Gage Blocks to produce a section of any pitch diameter over 1". Furnished in pairs, in any pitch.

"TAKE IT TO TAFT-PEIRCE"

FOR DESIGN • ENGINEERING • CONTRACT MANUFACTURING • TOOL ROOM SERVICE • SMALL TOOLS • GAGES • SPECIAL MACHINERY

THE TAFT-PEIRCE MFG. CO., WOONSOCKET, RHODE ISLAND

DeVilbiss Celebrates Its 50th Anniversary

CLEVELAND.—The DeVilbiss Co., Toledo, Ohio, manufacturer of spraying equipment, air compressors and exhaust systems, this year is celebrating the fiftieth anniversary of its founding in 1888 by Dr. Allen DeVilbiss, who started out making the medicinal atomizer bearing his name. The company is headed by Allen DeVilbiss Gutches, grandson of the founder. He has been president since the death of Thomas A. DeVilbiss in 1928.

Blaw-Knox Acquires Electro-Plating Firm

PITTSBURGH—The Blaw-Knox Co., Pittsburgh, by its acquisition of the Electro-Chemical Processes Co., Youngstown, will produce equipment for electro tinning of steel as well as other continuous electro plating processes. The newly acquired company will be operated as the Electro-Chemical Processes Division of Blaw-Knox Co., with headquarters at Groveton, Pa. The new division will also produce equipment for continuously plating tin, nickel, brass, bronze, and copper on steel. Machinery for continuous cleaning and pickling of strip, sheet and wire, including rust

annual dinner in London, was addressed by Sir Alfred Hurst, who the demand for constructional steel of all kinds had risen very rapidly, but he believed they had succeeded in maintaining prices at a reasonable level. However, he said that he did not pretend that their system of prices had met with universal approval.

H. Cunningham, the chairman, claimed that the prices charged in the industry had been altogether moderate.

"We pride ourselves on this," he

added, "that if anyone feels unjustly treated in the matter of tenders submitted he can always appeal to the association to review them. I wish it to be clearly established that there will be no change in the price of steel until the end of 1938. Some people seem to think that the price will fall during 1938, but I have the authority of Sir Andrew Duncan to say definitely that there will be no alteration in the price of steel until the end of 1938, and it may not happen even then."



J. S. NACHTMAN

proofing and coloring, will also be manufactured.

J. S. Nachtman, president Electro-Chemical Processes Co., will be in charge of the new division. Following his graduation from the Colorado School of Mines, he was associated with the American Steel & Wire Co., the E. W. Bliss Co., and subsequently with the Thomas Steel Co. at Warren, Ohio.

British Assured Of Stable Steel Prices

LONDON (By Mail).—The British Constructional Steelwork Association which has just held its first

FEEL ITS SAFE TRACTION!

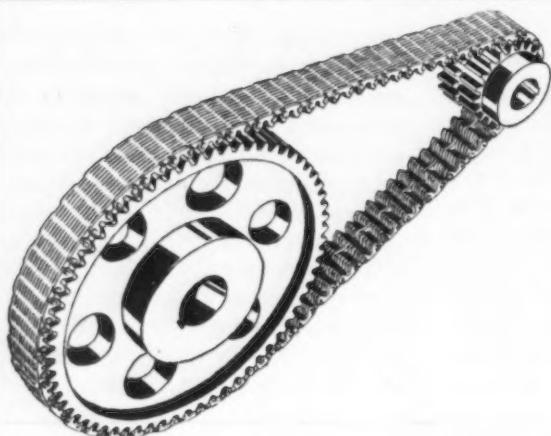


Feel those projections! Every surface of the Inland 4-Way Floor Plate tread is curved. There are no pockets to collect dirt, no sharp corners to catch a stubbing toe. This floor is safe, easy to keep clean and remains attractive year after year. Write for the pictorial catalog which illustrates its many money-saving and accident-preventing uses.

INLAND 4-WAY FLOOR PLATE

MADE BY THE INLAND STEEL CO., 38 SO. DEARBORN ST., CHICAGO, ILL.

SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES
PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS



Tailor Made Transmission

A Ramsey Silent Chain Drive is designed and made strictly for your job. You do not select it from a catalog of hundreds of combinations which may or may not suit your requirements. You do not adjust your machine to suit centers of the chain drive sent you. And finally you do not have to pull the machine apart to get it on. The chain is connected when installed. Truly a tailor made job to your specifications, resulting in a positive drive with absolutely no slippage and waste of power. This is why Ramsey Silent Chain Drives give such long, efficient service. Let us help you with your next transmission problem. Send for catalog No. 636. Ramsey Chain Company, Inc., 1050 Broadway, Albany, N. Y.

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Veteran springmakers are balanced with the enthusiasm of youth...technically trained men with practical knowledge...for a product of uniform, dependable quality, now, or years from now. The quality is Dunbar's, the products:
SPRINGS, WIRE FORMS, SMALL STAMPINGS

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DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT

Mr. Jackson, Please "Tune In"

From the London, England,
Sphere

The United States contains 6 per cent of the world's area and 7 per cent of its population. It normally consumes 48 per cent of the world's coffee, 53 per cent of its tin, 56 per cent of its rubber, 21 per cent of its sugar, 72 per cent of its silk, 36 per cent of its coal, 42 per cent of its pig iron, 47 per cent of its copper, and 69 per cent of its crude petroleum.

The United States operates 60 per cent of the world's telephone and telegraph facilities, owns 80 per cent of the motor cars in use, operates 33 per cent of the railroads. It produces 70 per cent of the oil, 60 per cent of the wheat and cotton, 50 per cent of the copper and pig iron, and 40 per cent of the lead and coal output of the globe.

The United States possesses almost \$11,000,000,000 in gold, or nearly half of the world's monetary metal. It has two-thirds of civilization's banking resources. The purchasing power of the population is greater than that of the 500,000,000 people in Europe and much larger than that of the more than a billion Asiatics.

Responsible leadership which cannot translate such a bulging economy into assured prosperity is destitute of capacity. But pompous statesmen, looking over the estate, solemnly declare that the methods by which it was created are all wrong, ought to be abandoned, must be discarded, that the time has come to substitute political management for individual initiative and supervision.

There is only one way to characterize that proposal—it is just damn foolishness.

G. M. Diesel Demand 10 Times Output

DETROIT.—Demand for diesel engines manufactured at the new Detroit plant of General Motors Corp. is more than 10 times the present total output, according to R. K. Evans, vice-president in charge of diesel development. Since the opening of the factory in January, there have been thousands of inquiries, mostly from farming sources, on the new, small packaged units. The greatest interest centers on the series 71, composed of engines ranging from 22 to 160 hp.

"Production will be increased each month, not only to meet current demand, but also to develop business for what is worth," said Mr. Evans. "Our market is so scattered that it will take several years to arrive at a true estimate of needs. There is marked attention by manufacturing groups to diesel possibilities and the extension of sales in this channel offers a broad field."

Expansion in the use of diesel engines on marine service was stressed by Mr. Evans. He declared that water transportation assured a particularly broad market for these products. Mr. Evans also referred to the increasing use of diesel engines in trucks, buses and trains to show how commercial carrier transport is extending dependence on this type of power plant. He believes that during this year further gains will be registered.

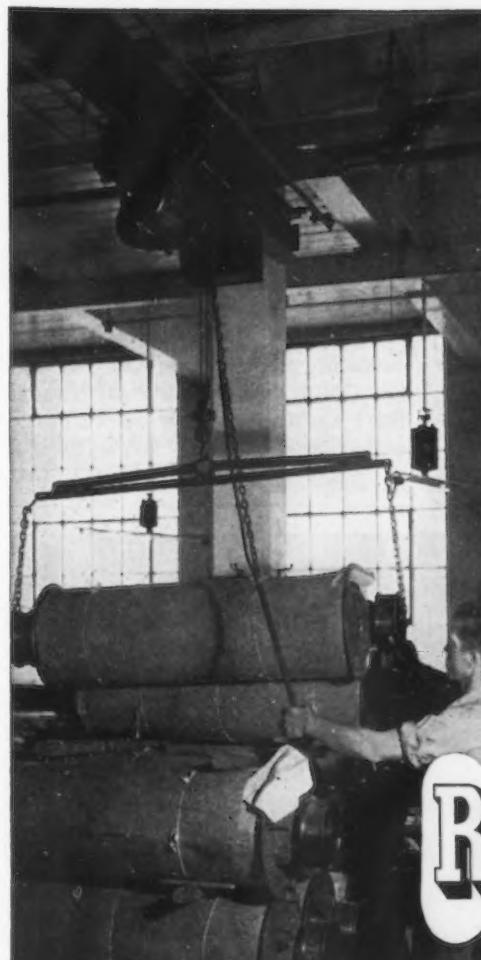
Armco Purchases More Rustless Iron Stock

AMERICAN ROLLING MILL CO. purchased 227,600 common shares of Rustless Iron and Steel Corp. from stockholders during 1937 and owned 47.05 per cent of the Rustless common stock outstanding on Dec. 31, 1937. A total of 178,700 shares was held previously.

Rustless Iron and Steel earned \$713,139 in 1937 compared with \$357,070 in 1936 while last year sales were \$4,193,461 against \$2,646,794 in 1936.

Lewis Foundry Gets India Mill Contract

LEWIS FOUNDRY & MACHINE DIVISION of the Blaw-Knox Co., Pittsburgh, has received a contract for two balanced three-high rolling mills, equipped with automatic screw down, from Bengal Steel Co., Ltd., of India.



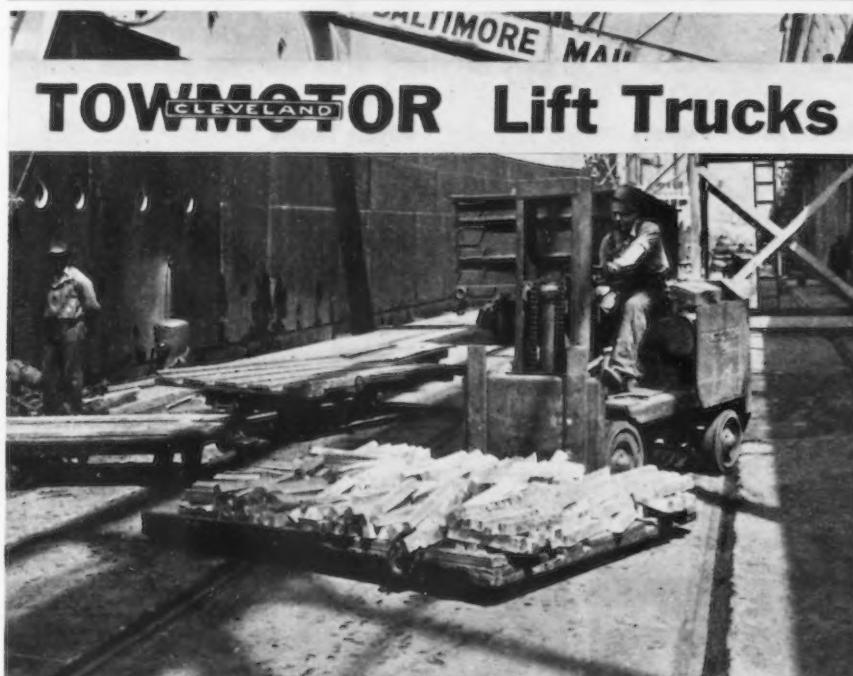
How READING does a 2-man job at STEHLI

HANDLING 500-pound warps of material was a *two and three man job* at Stehlí Silk's entering and twisting department until Reading came along. Now the extra men are relieved for other duties—ONE man and this 750-pound Reading Electric Hoist, on crane and T-rail, handle the warps easily.

Reading installations like this have cut handling costs—saved strained backs—in scores of plants. Name your materials handling specifications; we'll meet them! READING CHAIN & BLOCK CORP., READING, PENNA.

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Towmotor lift trucks handle heavy material close to the floor to save hand labor, yet the machine is built to lift it to most any desired height and stack it when and where you want it. Smooth hydraulic lift—precise control—greater safety for operator. Lower cost per year and per ton moved. Write for bulletin with specifications and prices.

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New York Office: 96 Liberty Street, Phone: Barclay 7-3090

Bethlehem, Great Lakes Deny SWOC Claims of Recognition

CLAIMS by Philip Murray, SWOC chairman and leader of the steel unionizing campaign, that Bethlehem Steel Corp. and Great Lakes Steel Corp. have recently made agreements with the SWOC were denied by spokesmen for the steel companies.

E. T. Weir, board chairman of National Steel Corp. (parent company

of Great Lakes) said at Pittsburgh that a statement that Great Lakes Steel has entered into some form of agreement with the SWOC is "positively untrue."

"Neither the Great Lakes Steel Corp., nor any other unit of National Steel Corp., has made an agreement of any kind with the SWOC, verbal or otherwise," said Mr. Weir. "I am

at a total loss to understand why the SWOC would make such a statement without the slightest basis in fact."

Bethlehem Steel Corp. issued the following comment on the SWOC claims:

"Inquiries at plants of Bethlehem Steel Corp. brought forth the statement that Bethlehem had not made any changes whatsoever in its policy of dealing with labor matters. It was stated that the policy of collective bargaining which has been in existence for many years at the various plants is well known to all the employees and has many times been publicly stated."

A release from the SWOC headquarters at Pittsburgh early this week said, in part:

"Philip Murray, chairman of the SWOC, announced today that SWOC union committees have been recognized in two of the so-called 'Little Steel' corporations, Bethlehem Steel and Great Lakes Steel. Negotiations with these companies have been going on for some time between mill officials and sub-regional directors of SWOC and union lodge officers."

"The first union committee was set up in the Johnstown, Pa., plant of Bethlehem where 28 union men were recognized to handle grievances of union members. In the Bethlehem, Pa., plant of Bethlehem Steel, 32 union men were recognized by the company as comprising the union grievance committee."

"In addition to winning recognition of union committees in Great Lakes Steel, the SWOC, through Julius Sobonya, sub-regional director, and officers of Lodges No. 1029 and 2051, effected a definite policy for observance of seniority rights in all future layoffs."

This week Mr. Murray declared that the movement for wage reductions has been stopped. He pointed out that the clause (in United States Steel Corp. subsidiary contracts) permitting reopening of negotiations "protects union mills should non-union mills decide to reduce wages and on the other hand if business and employment conditions improve, as we hope they will, our union is in a position to take advantage of such improved conditions by likewise giving 10 days' notice of a desire to negotiate new contract terms."

The SWOC announces that union contracts have been extended under their present terms with Timken Roller Bearing Co., Canton, Ohio; Union Electric Steel Co., East Carnegie, Pa.; Columbia Steel & Shafting, Carnegie, Pa., and Cooper-Bessemer Corp., Grove City, Pa.

UDYLITE BRIGHT NICKEL PLATING PROCESS

Bright, Ductile Deposits Direct from the Bath

Finishing costs are reduced to a minimum. . . . Small parts require no nickel buffing; some large parts need light coloring only. . . . No copper buffing. . . . Cut-through rejects are eliminated. . . . The smooth, ductile nickel coating does not flake or peel.

Stable, Efficient, Easily-Controlled Plating Solution with Good Throwing Power

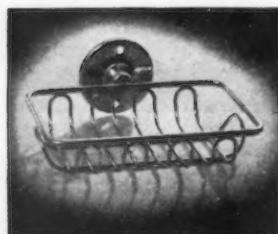
The ingredients of the solution do not decompose to produce undesirable products. . . . The bath operates at an efficiency of 98 per cent. . . . Highly lustrous nickel deposits are obtained over a wide range of plating conditions.

Udylite Service

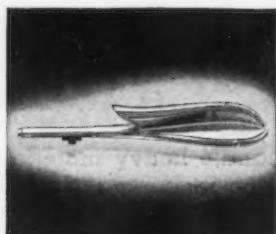
As for other plating processes, Udylite realizes the value of service. Therefore, specially trained engineers install The Udylite Bright Nickel Process and instruct the plating operators thoroughly before the installation is turned over to them.

* * *

For full information on The Udylite Process of Bright Nickel Plating, get in touch with the nearest Udylite office. *The Udylite Company, 1651 E. Grand Blvd., Detroit, Michigan—New York, 30 E. 42nd Street; Chicago, 1943 Walnut Street; Cleveland, 3756 Carnegie Avenue; San Francisco, 114 Sansome Street.*



FINISHING MADE EASY—
This inexpensive wire soap dish is copper flashed and bright nickel plated directly on unburnished steel. The finishing operations are simple and ECONOMICAL.



50% SAVINGS—This part is buffed, copper plated (no copper buffing), bright nickel plated, light nickel wiped, then chromium plated. Elimination of operations means large direct savings.



GOOD THROWING POWER—This saucepan (8 in. dia. x 5 in. deep) is flashed with copper, then bright nickel plated. The Udylite solution deposits a bright, even coating on entire inner surface.

AFL Helps Block Inquiry on NLRB

WASHINGTON. — Opposition of the American Federation of Labor is believed to have been an important contributing factor in shutting off a Senate Committee investigation of the National Labor Relations Board. That there will be no such inquiry, as had been proposed by Senator Burke, Democrat of Nebraska, became clear when the Senate Judiciary Committee on Monday recommended that action be "postponed indefinitely."

Senator Burke's resolution included charges that the board has favored one type of union organization as opposed to all other groups, intimidated local public officials, employers and workers in defiance of the decrees of Federal courts, violated the right of freedom of speech and freedom of the press, and engendered disrespect for law and order and increased dissension in industrial relations.

The AFL opposition to the investigation was taken to indicate that it feels that either the NLRB is no longer so biased as previously in favor of CIO or that it feels it can cultivate better relations and therefore more favorable treatment at the hands of the board. At one time the AFL was bitter in its denunciation of the board, claiming it was CIO-dominated.

Steel Lead Coated For Cold Drawing

IT is known that metals having a certain electrolytic pressure when immersed in a cold solution of a salt of a metal that has a lower electrolytic pressure, are covered by a layer of this latter metal. Experience, however, has proved that iron or steel does not conform absolutely to the above generalization. For instance, if iron or steel is immersed in a cold solution of a lead salt, the lead leaves on the surface of the iron or steel an incoherent granulation instead of forming a proper continuous layer. Furthermore, it is known that iron and its alloys do not present the property of amalgamating. For instance, if mercury is brought into contact with an iron surface, it would not amalgamate it, but only leave a very thin film.

A new lead coating process, now being introduced in this country by Conrad Wolff, Newark, N. J., is based on the above facts. The procedure

requires a cold solution of mercury salt in which the steel objects are immersed for one minute or less and subsequently immersed in a cold solution of lead salt. Thus, the soft lead coat is not attached directly on the surface of the steel, but remains separated therefrom by a film of mercury. This fact is valuable since, after the completion of the drawing operation, the entire layer can easily be removed, leaving the surface of the drawn object perfectly smooth.

Tubes, bars, etc., treated according

to this process may be cold drawn five or six times without the necessity of intermediary annealing and pickling.

Birmingham Foundry Practice Meeting Feb. 24

THE sixth annual joint foundry practice meeting of the Birmingham chapters of the American Foundrymen's Association and the American Society of Mechanical Engineers will be held Feb. 24-25.

Remember when

STEARNS set the pace in scientific magnetic pulley construction back in 1917?

Remember when

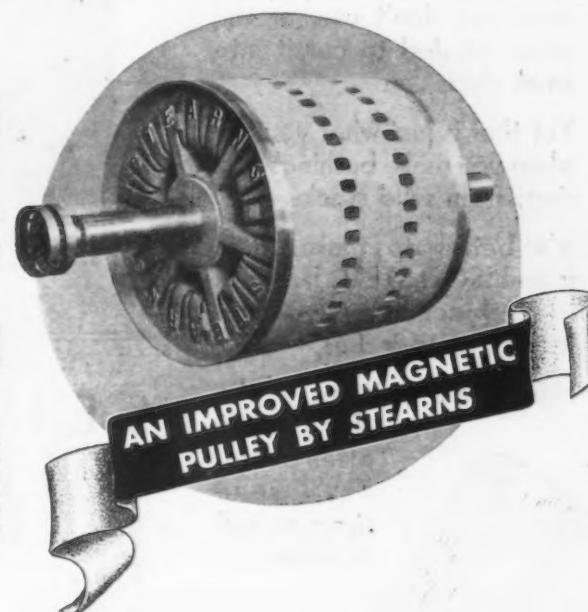
STEARNS introduced air cooling in magnetic pulley construction back in 1922?

Remember when

STEARNS introduced the unit one-piece integrally cast magnet body back in 1924?

Remember when

Separation at peak loads carried by conveyor belts was made possible because of the deep, strong magnetic field provided by only STEARNS HIGH DUTY Magnetic Pulleys?



STEARNS HIGH DUTY Magnetic Pulleys incorporate features which are basic in principle in magnet design. Each detail contributes to the maximum magnetic density, depth of field, uniform flux distribution and a scientific application of the elements used.

Magnetic pulleys today are as important as the conveyor in which they are used. In the STEARNS HIGH DUTY Magnetic Pulleys there is always sufficient magnetic power in reserve to handle a peak load.

Progress is born of experience and experience is your best protection. STEARNS has been building magnets for thirty-eight years. Does this mean anything to you?



For complete information and details write for bulletin No. 300.

STEARNS MAGNETIC MFG. CO.
Formerly Magnetic Mfg. Co.
SEPARATORS DRUMS CLUTCHES
ROLLS HIGH STEARNS DUTY BRAKES MAGNETS
LARGEST EXCLUSIVE BUILDERS OF MAGNETIC EQUIPMENT

635 So. 28th Street

Milwaukee, Wis.

USE BISCO TUBING

YOU PAY LESS -for Steel -for Labor

There is no need to pay for steel you don't use, or the labor needed to cut it into small chips . . .

Yet that is just what you do, when you make bushings and rings from solid stock.

It's better to make them from BISCO STEEL TUBING—which comes in all diameters up to 14 inches.

Have some in stock, of the sizes most often used. You'll save time as well as money.



BISCO TUBING

- Tool Steel
- Alloy Steel
- Stainless Steel
- Cold Drawn Steel
- For Mechanical Uses
- For Ball Bearings

All fine steels
in the form of
T U B I N G

**THE BISSETT
STEEL COMPANY**
945 East 67th St.
CLEVELAND, OHIO
1036 West Lake St., Chicago, Illinois

STOCK

ORDER FROM



H. E. LEWIS becomes president as well as chairman of Jones & Laughlin Steel Corp.



S. E. HACKETT, who has resigned the presidency of Jones & Laughlin.

S. E. Hackett Leaves J. & L.; L. M. Parsons to Head Sales

H. E. LEWIS, chairman of the board, Jones & Laughlin Steel Corp., Pittsburgh, in addition to his position, has been elected president of the company succeeding S. E. Hackett who resigned as president, director and member of the executive committee on Feb. 14. Effective March 1, Lewis M. Parsons will become director and vice-president in charge of sales, Jones & Laughlin Steel Corp. He has been with the Bethlehem Steel Co. for many years and lately in charge of its Philadelphia sales office.

Mr. Hackett started his long career in the steel industry with the former American Tin Plate Co., Chicago, in 1899. In 1902 he was manager of orders and later purchasing agent for Joseph T. Ryerson & Son, Inc., Chicago. He joined Jones & Laughlin in 1916 as manager of the Chicago warehouse and district sales manager of the Chicago district and in 1918 became general manager of sales of the company. His next promotion made him vice-president in charge of sales and a director in 1923 and in 1934 he became president, director and member of the executive committee, which positions he held until his resignation on Feb. 14.

Mr. Parsons becomes one of the younger steel executives. He reached

his 40th birthday on Jan. 9, last. After attending William Penn Charter preparatory school, he entered the University of Pennsylvania in the class of 1919, but his college work was cut short by the World War. In his short time in college he "made" the freshman swimming team, varsity crew and football team. He entered service in the Navy, where he was first in the destroyer service and later in the Flying Corps, in which he was commissioned and made an instructor pilot in July, 1918. He ended his war service in March, 1919, and entered the employ of Bethlehem Steel Co. in July of that year. He completed some of his studies at Massachusetts Institute of Technology, from which he received a degree. In November, 1932, he was appointed assistant manager of sales of Bethlehem's Philadelphia office, and in March, 1936, he was promoted to Philadelphia sales manager.

SWOC Plans Union For Steel Clerical Forces

CHICAGO—Although the SWOC is concentrating on organization of production employees in steel companies, the next step is inclusion within that CIO unit of the "white



Lewis M. Parsons appointed vice-president in charge of sales of Jones & Laughlin.

"collar" workers in the mills, according to Frank Grider, Gary SWOC official.

The office workers to be organized into the SWOC are only those employed in mill offices while sales office employees, according to Mr. Grider, may enter another CIO unit, the United Office and Professional Workers Union.

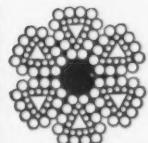
\$35,000 of Tin Plate Scrap Goes To Japan

WASHINGTON—All for shipment to Japan, 2306 gross tons of scrap tin plate valued at \$35,000 was involved in the 29 licenses issued in January by the State Department. Because the scrap contains only a negligible quantity of tin, the State Department does not contemplate curtailment of licenses.

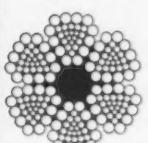
Freyn To Build "Farthest North" Blast Furnace

FREYN ENGINEERING CO., Chicago, is about to add the farthest north modern blast furnace to the list of Freyn design blast furnaces at the other three extremities of the world. Colvilles, Ltd., have arranged for the construction, by Ashmore, Benson, Pease & Co., Ltd., British associates of the Freyn Engineering Co., of a furnace of nominal 500-ton capacity, together with auxiliary plant, at Glasgow, Scotland.

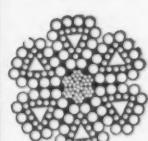
This will be the first of two duplicate furnaces projected for construction at its Clyde Iron Works.



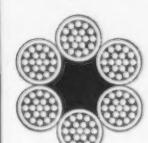
Style B
Flattened Strand



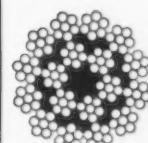
"O" Flattened Strand



Wire Rope Center



Steel Clad



18x7
Non-Rotating

You Can Depend On "HERCULES"*(Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

-PREFORMED-

For maximum efficiency in Preformed Wire Rope, use Preformed "HERCULES". It is available in both Round Strand and Flattened Strand constructions.

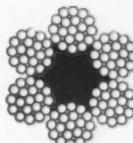
Made Only By

A. LESCHEN & SONS ROPE CO.

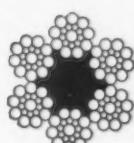
Established 1857

5909 KENNERLY AVENUE, ST. LOUIS, MO.

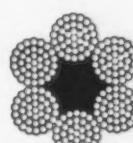
New York . . . 90 West Street San Francisco . . . 520 Fourth Street
Chicago . . . 810 W. Washington Blvd. Portland . . . 914 N. W. 14th Avenue
Denver . . . 1554 Wazee Street Seattle . . . 2244 First Avenue South
* Reg. U. S. Pat. Off.



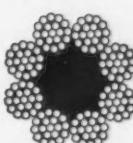
6x19
Filler Wire



6x19
Seale

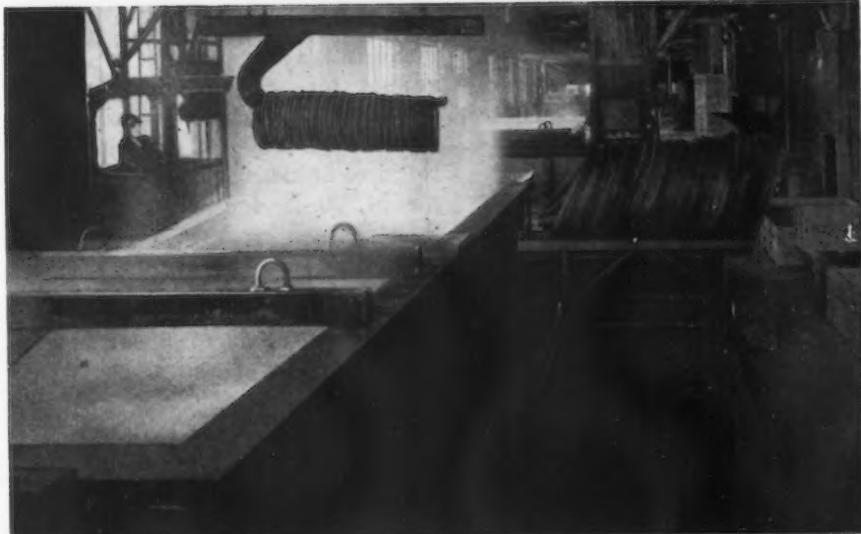


6x37
Extra Flexible



8x19
Extra Flexible

BASOLIT ^{Protected} PICKLING TANKS



Courtesy of the B. F. Goodrich Co.

This installation consists of two rubber lined steel tanks each 14½ ft. long x 10 ft. wide x 6½ ft. deep installed December, 1935, in the Atlantic Wire Co. plant at Branford, Conn. The lining is of double brick and BASOLIT. If you are still using wooden tanks, either unlined or lined with lead or alloys—or if you have brick tanks jointed with sulphur—you will be interested in BASOLIT. The many hundreds of BASOLIT pickling tanks of various types are producing clean, spotless pickling without leakage, acid loss or expensive shutdowns for repairs.

NUKEM PRODUCTS CORP.

BUFFALO, NEW YORK

NEW YORK

PITTSBURGH

DETROIT

KITCHENER, ONT.

TRADE NOTES.

American Motor Products Co., 160 Varick Street, New York, recently organized, has bought all assets, including tools, equipment and patents, of American Motor Products Corp., same address, which recently failed. Company will manufacture electric parts for automobiles. B. Sadoff is owner. He is also president of Wells Mfg. Corp., Fond du Lac, Wis.

Roots-Connersville Blower Corp., Connersville, Ind., has appointed John G. Kelly, Inc., 210 E. 45th Street, New York, as distributor of boiler service units consisting of condensate and return outfits for gravity systems, boiler

make-up and condensate return equipment, and direct feed boiler supply service. Frank A. Kristal, 30 Church Street, New York, will concentrate on sale of Roots-Connersville turbine pumps for industrial applications.

Consolidated Iron-Steel Mfg. Co., Cleveland, has purchased from the V. S. Co. a seven-acre tract and two buildings at Babbitt Road and the Nickel Plate Railroad, Euclid, Ohio. The buildings formerly were occupied by the Taylor-Boggis Foundry Co. I. Theodore Kahn is president of Consolidated; Joseph Lehman is secretary and Kenneth Davidson is treasurer.

Hendrick Mfg. Co., maker of perforated metals, steel flooring, decorative grilles and other products, has announced a change in

the location of the Pittsburgh office. The new address is Room 744, Gulf Building.

Stainless Metals, Inc., manufacturer of stainless steel specialties, has moved from 225 Fifth Avenue, New York, to a building it has acquired at 31-49 Twelfth Street, Long Island City, where it has manufacturing and warehouse facilities.

New Haven Copper Co., Seymour, Conn., has filed application for membership in the Copper and Brass Research Association, which will be accepted at the next meeting of the executive committee.

Fairbanks, Morse & Co. has moved its general offices to 600 South Michigan Avenue, Chicago.

Pioneer Gravel Equipment Mfg. Co., 1515 Central Avenue, N.E., Minneapolis, has changed its name to Pioneer Engineering Works, Inc.

American Well Works, Aurora, Ill., manufacturer of water and sewage pumping equipment and auxiliaries, has established an office at 743 North Fourth Street, Milwaukee, to serve Wisconsin and Minnesota. F. E. Davis, associated with the firm for 20 years, has been appointed district manager at Milwaukee.

Harnischfeger Corp., Milwaukee, has appointed the Deaderick Machinery Co., Knoxville, Tenn., as representative for its line of welders and welding electrodes in eastern Tennessee.

Foundry Service Co., a new firm, has opened a plant in Birmingham to distribute foundry supplies and equipment. W. J. Bach is general manager.

FINANCIAL NOTES

Pittsburgh Steel Co. report net loss for quarter ended December, 1937, after depreciation, depletion, interest, Federal and State taxes, of \$420,438. This compares with net profit of \$261,870 for the December quarter of 1936, and net profit of \$257,160 for the September quarter of 1937. Net loss amounted to \$163,278 for six months ended Dec. 31, 1937, as against net profit of \$571,114 in the corresponding 1936 period.

Otis Steel Co. stockholders on April 22 will vote on a proposal to eliminate by amendment the company's 7 per cent prior preferred stock, of which 1744 shares were outstanding Oct. 31. The company offered to redeem the shares Jan. 1 at \$110 and accrued interest, but many holders failed to turn in their shares.

Lukens Steel Co. and subsidiaries report for the year ended Oct. 16, 1937, a net income of \$158,218 which is equal to 50c. each on 317,976 capital shares, against \$112,205 or 35c. a share in the year ended Oct. 17, 1936.

Blaw-Knox Co., Pittsburgh, and its subsidiaries, report consolidated net profit for the year ended Dec. 31, 1937, of \$2,379,692, after depreciation and Federal and State taxes, equivalent to \$1.78 a share on capital stock. This compares with net profit of \$1,548,175 or \$1.17 a share in 1936. Net profit for the last six months of 1937 was \$1,084,179 or 81c. a share, compared with net profit of \$1,295,513 or 97c. a share in the first six months of the year, and with net profit of \$872,882 or 66c. a share in the last six months of 1936.

Pittsburgh Steel Co. reports for the quarter ended Dec. 31, 1937, a net loss of \$420,438 after depreciation, interest, taxes, etc., compared with net profit in the like 1936 period of \$261,870.

A. M. Byers Co., Pittsburgh, reports for the fourth quarter of 1937 a net loss of \$265,699 compared with a net loss of \$45,519 in the corresponding period of 1936.

PRODUCTS

- Steel Castings
- Forgings
- Rolled Wheels
- Heavy Springs
- Rolled Rings
- Gear Blanks

THE PLACE TO BUY HEAVY FORGINGS

Standard is a prompt source of supply for heavy forgings whether they be relatively simple like this 5,600 lb. forged ball drop or more complex like the 14,300 lb. forged crankshaft pictured here.

Standard's forgings and castings, too, are made from open hearth steel produced under close metallurgical control in our own furnaces.

STANDARD STEEL WORKS CO.
Subsidiary of the
Baldwin Locomotive Works
BURNHAM PENNA.

Girdler Says Steel Price Cuts Never Boom Market

REDUCTIONS in steel prices have never resulted in an immediate increase in steel buying, Tom M. Girdler, Republic Steel Corp. chairman, declared Feb. 10 at the 14th annual conference of Iron, Steel and Allied Industries of the California State Chamber of Commerce at Del Monte, Calif.

"There is not the slightest basis in my experience for believing that steel price reductions now would call into being a great surge of demand," Mr. Girdler said. The Republic official characterized as "false" the assumptions that (a) price reductions would lift demand, (b) steel prices are excessive and out of line with production costs, (c) the steel industry can indefinitely continue its present wage level at a reduced level of prices, and (d) profits in the steel industry are high.

Prices Linked to Costs

"Prices must be related to costs, if a business is to continue to exist," Mr. Girdler said. "In the steel industry the most important single item of cost is labor. From 40 to 50 cents of each sales dollar in the steel industry goes directly into the pay envelope. For that reason wages and prices are inseparably linked. It would not be possible for any steel company to maintain prices on a lower level while present wage rates remain unchanged. If industry were to be forced to pay wages it cannot afford, the whole industrial system would surely break down."

"The steel industry wants to move forward," Mr. Girdler added. "I believe that the country is ready to move ahead, once confidence is restored by permitting our industrial and economic systems to function free from harassments and oppressive controls."

E. L. Shaner, editor of *Steel* told the conference that "one reason why industry's present task of developing a consciousness for statesmanship seems so formidable is because industry has sorely neglected its responsibilities in the past."

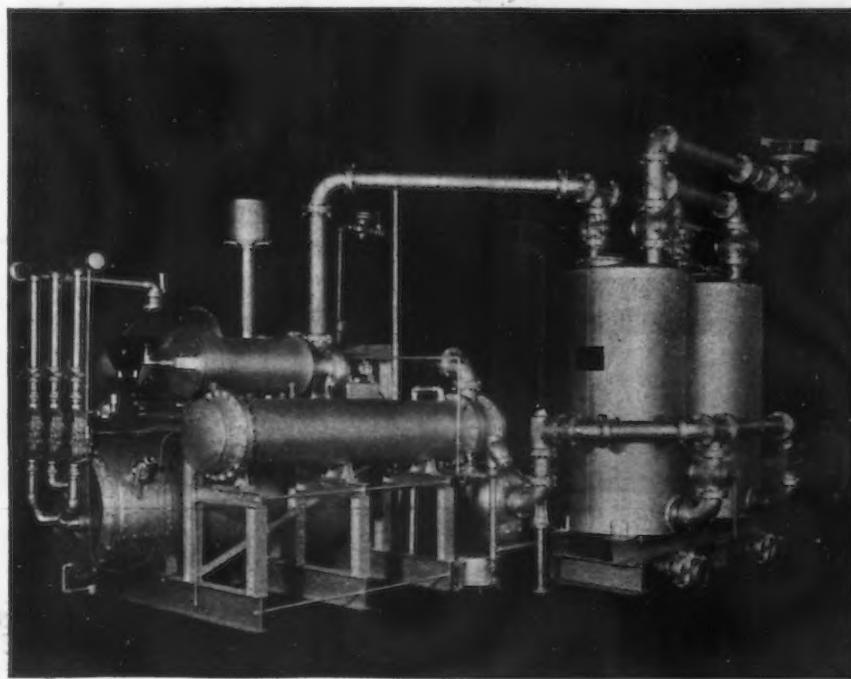
"What we need today," said Mr. Shaner, "are frankness and simplicity in industry's public relations work. Every competent industrialist should take it upon himself to do his part in explaining industry's position to the public. In many instances," he said, "it should be able to take the lead

away from politicians in initiating sound social reforms."

Walter S. Doxsey, executive secretary, American Steel Warehouse Association, Inc., told the gathering that "there is too much competition within the industry. The steel mills too often harass their best customers, the fab-

ricators and the distributors—and in what other industry do the distributors receive less protection from their sources of supply?

"Brokers with no other investment than this month's telephone bill and a hat rack compete with the mills and the warehouses. Steel products," said Mr. Doxsey, "are priced by the mills on the basis of competition rather than costs. Item extras are applied to some products, order extras to others. Some products take agents' commis-



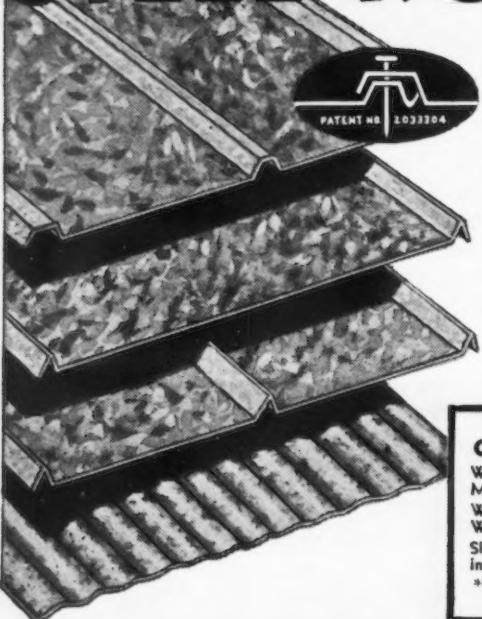
MORE AND MORE producers of quality steel are turning to the Kemp Atmos-Gas Producer for bright annealing. In fact, the preponderance of Kemp equipment in the new mills suggests a trend to this complete, compact, continuous, automatic Atmos-Gas Producer that has brought operating cost to a new all-time low.

These Kemp units provide capacities of 1,000 CFH to 15,000 CFH and are designed to fit the job, incorporating the auxiliaries necessary to the various treatments and materials.

A new descriptive folder and Special Bulletin A 101.6 will give you details. Address **The C. M. Kemp Mfg. Co. at 405 E. Oliver St., Baltimore, Md. or Oliver Bldg., Pittsburgh, Pa.**

KEMP of BALTIMORE

STEEL ROOFING



Every application of steel roofing and siding is covered in Continental's 14 styles. The new "Tyl-Lyke" with its wide rib design combines a new style in steel roofing with a new patented lap. All styles, in wide variety of lengths and gauges, are made from special analysis (or .20% minimum copper-bearing) basic open hearth steel, galvanized by the SUPERIOR PROCESS. Ridge roll and other accessories are furnished for all styles.

CONTINENTAL STEEL CORP.

General Offices: Kokomo, Indiana
Plants at Canton, Kokomo, Indianapolis

OPEN HEARTH STEEL

Wire: Bright Basic, Annealed, *Konik, Special Manufacturers, Galvanized, *Flame-Sealed.
Wire Rods, Nails, Staples, Bale Ties, Barbed Wire; Fence—15 Types; Gates and Fittings.
Sheets: Black, Galvanized, Special Coated; Roofing and Siding—14 Styles.
*Trade Mark Reg. U. S. Pat. Office.

CONTINENTAL

SHEET STEEL AND WIRE PRODUCTS

BY THE BOX OR BY THE MILLION!

We stock
CAP SCREWS
IN ALL OF
THE SIZES
you need



Made by the Kaufman Process, our own patented method of manufacture developed in our own plant, Cleveland Cap Screws insure fast assemblies because they are so uniformly accurate and strong. A Class 3 fit is standard. Heads are a true wrench fit. Carefully pointed, nuts are quickly assembled. A stock of 30 million Cleveland Cap Screws is maintained at our four warehouses and the factory—ready for immediate shipment. Greatly increased plant capacity provides even better facilities for prompt handling of quantity production orders. Ask for Catalog E and current price list. THE CLEVELAND CAP SCREW CO., 2929 E. 79th St., Cleveland, Ohio.

CLEVELAND CAP SCREWS
SET SCREWS • BOLTS AND NUTS

Address the Factory or Our Nearest Warehouse:

CHICAGO, 726 W. Washington Blvd.
PHILADELPHIA, 12th & Olive Sts.
NEW YORK . . . 47 Murray Street
LOS ANGELES, 1015 East 16th St.

sions and distributor's discounts, others none. From all these cross-purposes and inconsistencies arise the problems that have puzzled and confused you for years. They are perplexing alike to steel producers, fabricators, distributors, and to all consumers of steel."

Some sessions of the conference were built around discussions of California's tax problems with Frederick J. Koster, California Barrel Co., San Francisco, and C. B. Tibbetts, Los Angeles Steel Casting Co., Los Angeles, and a member of the State Unemployment Reserves Commission, as the principal speakers. Mr. Tibbetts explained how industry, by co-operation among its members with regard to employee hiring, could reduce its unemployment insurance costs under the California Unemployment Reserves Act to a minimum.

The conference's principal resolution urged amendment of the Wagner Labor Relations Act to "protect employee's rights from coercion by overzealous employee's leaders" in addition to its present provisions against employer intimidation. The resolution also urged greater responsibilities for labor unions and making participation illegal in any strike not approved by 51 per cent of a union's membership.

The conference also placed on record its opposition to the so-called "70-car train limit" bill now pending before Congress and the charging of a state sales tax on a price which includes transportation costs. The latter measure was placed before the meeting at the request of steel warehousemen who seek equality with mill men; the latter pay a "use tax" on published shipping point price.

Officers of the conference, who were unanimously reelected, are: E. H. McGinnis, Union Hardware & Metal Co., Los Angeles, chairman; B. J. Osborne, Moore Dry Dock Co., Oakland vice-chairman; and C. S. Knight, California State Chamber of Commerce, secretary.

Trackwork Shipments Decline To 3135 Tons

SHIPMENTS of trackwork for T-rail track of 60 lb. per yard and heavier, as reported by the American Iron and Steel Institute, declined 669 tons to 3135 tons in January. This drop represents the fourth consecutive monthly decrease and is the smallest tonnage reported since December, 1935. Shipments in December, 1937, were 3804 tons, and in January a year ago were 7246 tons. The high point of 1937 was reached in March when 10,720 tons of trackwork was shipped.

OBITUARY

ARTHUR B. PAULL, director of purchases for Beals, McCarthy & Rogers, Inc., Buffalo steel warehouse, died last week in St. Petersburg, Fla., where he had been vacationing. He became associated with the company in 1889, serving as store manager for a time and assuming the office of purchase director in 1917. In 1920 he was elected a member of the board of directors. He was a former director of the National Supply & Machinery Distributors' Association and was active in the National Purchasing Agents' Association. Mr. Paull was 64 years old.

* * *

W. L. AMES, who retired from the screw manufacturing business in Worcester, Mass., several years ago, died of a heart attack at his winter home in Daytona Beach, Fla., on Feb. 7, aged 83 years. Early in life Mr. Ames was a professor of mechanical drawing at Worcester Polytechnic Institute.

* * *

MINARD POSSONS, former vice-president of the American Stove Co. until his retirement three years ago when he became vice-president of the Positive Safety Mfg. Co., Cleveland, died Feb. 11 in Cleveland.

* * *

GEORGE B. THOMAS, former secretary of the Lake Shore Foundry Co., Cleveland, and later Cleveland manager of the United States Pipe & Foundry Co., died Feb. 10 in Cleveland.

* * *

ALVIN GEORGE JAKE, secretary of the Richards Badger-Packard Machinery Co., Milwaukee, died on Feb. 4, aged 47 years. A native of Milwaukee, he joined the concern in 1920.

* * *

FRANK COLLINS, executive vice-president of the National Supply Co., Toledo, Ohio, died at his home in that city on Feb. 12, aged 67 years. He was also president of the Toledo Pipe Threading Co. He had been identified with the company for the past 50 years.

* * *

HARVEY S. FIRESTONE, chairman of the board of the Firestone Tire & Rubber Co., died of coronary thrombosis at his home in Miami Beach, Fla., on Feb. 7, aged 69 years. A pioneer in the tire industry, Mr. Firestone kept pace with the expanding automotive industry.

The advertisement features a grid of nine different perforation patterns. The top row shows a solid black square, a diagonal hatched square, and a solid white square. The middle row shows a solid black square, a solid white square with a black grid pattern, and a solid black square with a black cross-hatch pattern. The bottom row shows a solid black square, a solid white square with a black cross-hatch pattern, and a solid black square with a black circular dot pattern. To the right of the patterns, the word "PERFORATED METAL" is written in large, bold, sans-serif capital letters. Below it, the words "INDUSTRIAL and ORNAMENTAL" are written in a smaller, bold, sans-serif font. At the bottom right, the text "Any Metal Any Perforation" is displayed in a bold, sans-serif font.

The advertisement features the company name "The Harrington & King Co." in a large, stylized, serif font. Below it, the words "PERFORATING" are written in a smaller, sans-serif font. At the bottom left, the address "5657 FILLMORE STREET—CHICAGO, ILL." is listed. At the bottom right, the address "New York Office, 114 Liberty Street" is listed.

The advertisement features the company name "BALDWIN-DUCKWORTH CHAIN CORPORATION" in a large, stylized, serif font. Below it, the address "Springfield and Worcester, Mass." is listed. On the left side, there is a call-to-action box with the text "CALL the B-D MAN". The background of the ad has decorative borders and patterns.

FABRICATED STEEL

... Lettings slightly higher at 6255 tons as against 5950 tons last week.

... New projects advance to 13,300 tons from 11,700 tons a week ago.

... Plate awards call for 2855 tons.

NORTH ATLANTIC STATES

Stamford, Conn., 380 tons, building, Union Industries, Inc., to Bethlehem Steel Co., Bethlehem, Pa.

New York, 220 tons, H-piles, angles and plates, North Beach Airport, to Belmont Iron Works, Philadelphia.

New York, 660 tons, pump and blower house on Tallman's Island, to Ingalls Iron Works Co., Birmingham.

New York, 375 tons, building, Hospital for Joint Diseases, to Harris Structural Steel Co., Plainfield, N. J.

New York, 310 tons, theater and store, 72nd Street and Broadway, to Dreier Structural Steel Co., New York.

Bayshore, N. Y., 555 tons, high school, to Harris Structural Steel Co., Plainfield, N. J.

Flushing, N. Y., 145 tons, storage and office building, to Long Island Iron Works, Long Island City, N. Y.

Auriesville, N. Y., 240 tons, building for Jesuit Shrine, to Ernest Iron Works, Buffalo.

Woodbridge, N. J., 150 tons, Lehigh Valley Railroad bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Braddock, Pa., 400 tons, junior high school, to Keystone Engineering Co., Pittsburgh.

THE SOUTH

Blytheville, Ark., 140 tons, Kress store, to Fort Smith Structural Steel Co., Fort Smith, Ark.

CENTRAL STATES

Kalamazoo, Mich., 190 tons, dormitory and union building, to Joseph T. Ryerson & Son, Inc., Chicago.

Hamilton County, Ohio, 420 tons, State bridge, to Fort Pitt Bridge Works Co., Massillon, Ohio.

Columbus, Ohio, 290 tons, boiler plant building, to Case, Crane & Kilbourne Jacobs Co., Columbus.

Richmond, Ind., 210 tons, addition and alterations, Johns-Manville building, to Indiana Bridge Co., Muncie, Ind.

Waterloo, Iowa, 190 tons, Montgomery Ward building, to Des Moines Steel Co., Des Moines, Iowa.

Fort Dodge, Iowa, 200 tons, plaster warehouse for National Gypsum Co., to Buffalo Structural Steel Co., Buffalo.

Chicago, 160 tons, Illinois Zinc Co. rolling mill building, to Austin Co., Cleveland.

WESTERN STATES

Fresno, Mont., 150 tons, highway bridge over spillway, to Joseph T. Ryerson & Son, Inc., Chicago.

Compton, Calif., 330 tons, Southern Pacific Railroad bridge, San Pedro branch, to Columbia Steel Co., Los Angeles.

San Francisco, 400 tons, second contract, viaduct, Yerba Buena Island roadway, to Judson-Pacific Co., San Francisco.

Los Angeles, 140 tons, rods and walers for United States Engineer, to Bethlehem Steel Co., Los Angeles.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 1000 tons, alterations, Grand Central post office.

New York, 550 tons, Lower East Side and Washington Heights health and teaching centers; bids received until Feb. 24 by Department of Public Works, New York.

New York, 500 tons, additions to public schools 89 in Bronx and 32 in Queens, Bethlehem Fabricators, Inc., Bethlehem, low bidder.

Lynbrook, N. Y., 5900 tons, grade crossing elimination Long Island Railroad Co., Poirier & McLane Corp., New York, low bidder on general contract.

Westchester-Putnam Counties, N. Y., 10,770 tons, West Branch-Kensico section, Delaware River aqueduct, three contracts; being rebid by Board of Water Supply.

Long Island City, N. Y., 1600 tons government housing work.

Elmira, N. Y., 110 tons, coagulation basic structure.

White Plains, N. Y., 1100 tons, apartment building, Garlock Corp.

Buffalo, 100 tons, warehouse for J. G. Pieri & Co., Buffalo, wholesale grocers.

Belfast, N. Y., 100 tons, school, bids Feb. 25; Bley & Lyman, Buffalo, architects.

Salem, N. Y., 400 tons, school; bids March 3.

Highland, N. Y., 300 tons, school; bids Feb. 18.

Fort Anne, N. Y., 250 tons, school; bids Feb. 24.

Hadley, N. Y., 300 tons, school; Lange-Finn Construction Co., Albany, low bidder on general contract.

Philadelphia, 200 tons, apartment building, Raleigh Corp.

Warren, Pa., 900 tons, State hospital buildings.

Washington, 3000 tons, museum building, Andrew W. Mellon estate.

SOUTH AND SOUTHWEST

Huntington, W. Va., 450 tons, bridge.

Hinton, W. Va., 550 tons, Bellpoint State bridge.

Ponca City, Okla., 140 tons, repairs to truss spans.

CENTRAL STATES

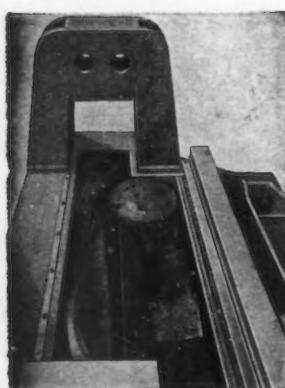
Norwood, Ohio, 400 tons, State grade elimination.

Pocahontas, Ill., 245 tons, bridge, Stupp Brothers Bridge & Iron Co., St. Louis, low bidder.

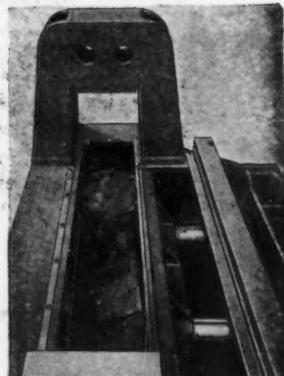
Greenfield, Ill., 275 tons, bridge; bids Feb. 25.

East St. Louis, Ill., 314 tons, Louisville & Nashville overhead crossing; bids Feb. 25.

TRIPLE COMPRESSION SCRAP BALERS



STYLE
100 TC
(100 x 51 x 36)
and other sizes
Also Regular
Double
Ram Presses
in all sizes



GALLAND-HENNING MANUFACTURING COMPANY

2724 S. 31st Street Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

Fairfield, Iowa, 240 tons, State underpass.

St. Louis, 230 tons, warehouse building, Steel Sales Corp.; bids in.

St. Louis, 100 tons, signal system platforms for municipal bridge; Missouri Bridge & Iron Co., St. Louis, low bidder.

WESTERN STATES

Hollywood, Calif., 300 tons or more, Broadway department store building; C. L. Peck, Los Angeles, general contractor, will take subcontract bids upon completion of specifications.

Sacramento, Calif., 250 tons, two cranes for Western Pacific Railroad.

San Pedro, Calif., 200 tons, Kress building.

FABRICATED PLATES

AWARDS

Paducah, Ky., 145 tons, welded steel pipe for United States Engineers, to American Rolling Mill Co., Middletown, Ohio.

Jeffersonville, Ohio, 100 tons, 100,000-gal. water tank, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plaquamine, Iowa, 710 tons, dredge and shore pipe, to American Rolling Mill Co., Middletown, Ohio.

Coulee City, Wash., 1900 tons, Grand Coulee Dam gate frames, to Bartlett Hayward division, Koppers Co., Baltimore.

NEW PROJECTS

Brooklyn, 3000 tons, 14,600 ft. of 60-in. by $\frac{1}{2}$ -in. plate welded steel pipe line, Department of Water Supply, New York. A. W. Banko, low bidder at \$377,000.

Rio de Janeiro, Brazil, 300 tons, tanks.

SHEET PILING

NEW PROJECTS

Blaisdell, Ariz., 2900 pieces 20 ft. long for Gila project; bids opened.

REINFORCING STEEL

... Awards of 1765 tons—
2900 tons in new projects.

AWARDS

New York, 200 tons, municipal garage in Bronx, to Joseph T. Ryerson & Son, Jersey City, N. J.

Jersey City, N. J., 100 tons, route 25, ramp connection to route 1, to Joseph T. Ryerson & Son, Inc., Jersey City.

Freehold, N. J., 125 tons, highway bridge, to Truscon Steel Co., Youngstown.

Cincinnati, 181 tons, State highway, to Pinkert Construction Co., Cincinnati.

Blaisdell, Ariz., 1160 tons, Salt River project, to Southern States Steel Co., Madison, Ill.

NEW REINFORCING BAR PROJECTS

Grafton, Mass., 100 tons, State hospital unit.

Westchester-Putnam Counties, N. Y., 783 tons, West Branch-Kensico section, Delaware River aqueduct; project being rebid by Board of Water Supply, New York.

New York, 650 tons, piers and end ramps, Bronx-Whitestone bridge, Lynn Avenue Con-

struction Co., Long Island City, N. Y., low bidder.

Lynbrook, N. Y., 1400 tons, grade crossing elimination, Long Island Railroad Co., Poirier & McLane Corp., New York, low bidder on general contract.

Lyons, N. J., 150 tons, Veterans' Hospital, project being rebid.

Baltimore, 156 tons, State Purchasing Bureau, bids in.

Roanoke, Va., 150 tons, Veterans' Hospital.

Hamilton County, Ohio, 198 tons, bridge; Pinkert Construction Co., Cincinnati, general contractor.

Chicago, 1000 tons, Park Board administration building.

East Moline, Ill., 100 tons, high school.

Jefferson City, Mo., 300 tons, office building for Board of Permanent Seat of Government; bids taken Feb. 15.

Fulton, Mo., 100 tons, building for State School for Deaf; McCarthy Brothers, St. Louis, low bidders on general contract.

South Pasadena, Cal., 133 tons, State subway and bridges on Arroyo Seco Parkway; bids March 3.

Buena Vista, Colo., 259 tons, work on State highway; bids Feb. 17.

Salem, Ore., 250 tons, State library building; bids opened.

IT PAYS TO CONSULT A SPECIALIST



• SEAMLESS MECHANICAL TUBING—Carbon and Alloy Steels • SEAMLESS PRESSURE TUBING—Boiler Tubes, Merchant and Locomotive, Heat Exchanger and Condenser Tubes in Plain Carbon, Special Alloy or Toncan Iron. • SEAMLESS AIRCRAFT TUBING—SAE 4130 X and SAE 1022 to Government Specifications in "Ohio Special" Non-Oxidized Surface Finish. • ELECTRIC WELDED TUBING—for All Mechanical Purposes, UPSETTING - FLANGING - TAPERING AND BENDING

Seamless
Tubing

Electric Welded
Tubing

Iron-Steel Import Volume Shows Slight Increase in December

IMPORTS of iron and steel products (excluding scrap) into the United States during December amounted to 25,104 gross tons, valued at \$1,568,033 and registered a volume increase of 5 per cent over the 23,985 tons received in November, according to a preliminary report released by the Metals and Minerals Division of the Bureau of Foreign and Domestic Commerce. However, the November value of \$1,647,464 was 5 per cent higher than in December. Against the December, 1936, trade of 38,514 tons, a sharp decline of 35 per cent was recorded in volume. The decline in value was 8 per cent.

Pig iron was the leading product imported in December from the standpoint of tonnage, the total of 9128 tons coming principally from British India, 6460 tons, and the Netherlands, 2502 tons. Structural shapes ranked next with 3396 tons, and came chiefly from Belgium. Next in importance were merchant steel bars, 2462 tons, taken mostly from Belgium.

Imports (In Gross Tons)	December		Twelve Months Ended December	
	1937	1936	1937	1936
Pig iron	9,128	10,423	111,697	165,808
Sponge iron	237	55	1,872	1,950
Ferromanganese ¹	399	3,675	23,965	30,396
Spiegeleisen	341	3,860	17,895	52,018
Ferrochrome ²		21	260	67
Ferrosilicon ³	57	50	2,924	526
Other ferro-alloys ⁴			52	526
Scrap	688	14,070	81,640	142,245
Pig iron, ferroalloys and scrap	10,850	32,154	240,305	393,536
Steel ingots, blooms, etc.		1	130	84
Billets, whether solid or hollow	223	100	2,077	995
Wire rods	634	1,386	15,818	18,911
Semi-finished steel	857	1,887	18,025	19,990
Concrete reinforcement bars	85	254	3,894	3,769
Hollow steel bars	191	125	2,538	1,930
Merchant steel bars	2,462	3,476	44,191	40,412
Iron slabs			1	14
Iron bars	93	61	1,959	1,408
Boiler and other plate			214	421
Sheets, skelp, and saw plate	258	1,489	8,800	22,609
Die blocks or blanks, etc.	1	7	102	184
Tin plate	15	46	248	234
Structural shapes	3,396	5,303	76,013	59,072
Sheet piling	99	...	2,260	2,512
Rails and track material	166	597	8,299	7,767
Welded pipe	748	466	9,540	5,636
Other pipe	2,136	1,525	32,947	29,461
Cotton ties			454	1,680
Other hoops and bands	1,878	1,670	26,697	24,038
Barbed wire	589	1,529	16,664	15,237
Round iron and steel wire	484	417	4,865	4,962
Telegraph and telephone wire	17	...	34	38
Flat wire and steel strips	262	289	4,033	2,886
Wire rope and strand	232	180	3,547	2,421
Other wire	65	259	3,247	2,042
Nails, tacks and staples	432	704	15,031	20,929
Bolts, nuts and rivets	9	23	571	516
Horse and mule shoes		61	397	426
Rolled and finished steel	13,618	18,181	266,546	250,604
Malleable iron pipe fittings		32	416	190
Cast iron pipe and fittings	39	225	3,282	928
Castings and forgings	428	205	4,586	1,480
Total	25,792	52,584	533,160	666,728

¹ Manganese content. ² Chrome content. ³ Silicon content. ⁴ Alloy content.

Exports (In Gross Tons)	December		Twelve Months Ended December	
	1937	1936	1937	1936
Pig iron	36,545	3,991	782,436	5,316
Ferromanganese and spiegeleisen	39	13	1,725	466
Other ferroalloys	362	382	2,780	2,486
Scrap, iron and steel	319,016	103,298	4,039,143	1,877,136
Scrap, tin plate	604	582	27,188	14,375
Waste-waste tin plate	151	5,146	29,563	44,621
Pig iron, ferroalloys and scrap	356,717	112,512	4,882,835	1,944,400
Ingots, blooms, billets, sheet bars	64,183	2,359	328,228	21,400
Ingots, etc., alloy steel incl. stainless	53	...	7,214	...
Skelp	624	4,368	76,478	70,202
Wire rods	2,811	1,467	60,006	34,872
Semi-finished steel	67,671	8,194	471,926	126,474
Bars, plain and reinforcing	17,448	6,499	150,385	55,653
Bars, alloy steel	585	...	6,399	...
Bars, stainless steel	29	...	222	...
Iron bars	65	54	2,221	1,010
Plates, plain and fabricated	25,537	22,342	406,843	99,280
Plates, alloy steel	64	...	5,052	...
Plates, stainless	10	...	153	...
Sheets, galvanized steel	5,863	6,250	75,446	61,455
Sheets, galvanized iron	752	244	5,552	1,753
Sheets, black, plain steel	20,749	10,489	279,737	140,158
Sheets, alloy steel	81	...	4,735	...
Sheets, stainless	298	...	1,751	...
Sheets, black iron	397	308	10,805	6,962
Hoops, bands, strips, plain steel	8,355	5,220	109,431	61,911
Hoops, bands, strip steel, alloy	43	...	1,139	...
Hoops, bands, strip steel, stainless	55	...	668	...
Tin plate and taggers' tin	31,364	24,377	354,339	235,600
Terne plate (including long terne)	517	306	5,153	3,298
Structural shapes, plain material	8,060	7,275	135,703	62,077
Structural material, fabricated	3,742	3,315	40,789	21,785
Sheet piling	657	55	7,441	2,830
Tanks, steel	12,547	1,794	44,611	21,574
Steel rails	28,596	4,835	148,182	73,455
Rail fastenings, switches, spikes, etc.	2,341	1,028	21,189	12,901
Boiler tubes	1,072	614	17,480	7,385
Casing and oil line pipe	8,057	5,118	94,712	32,334
Pipe, black and galv., welded steel	2,900	3,593	39,817	21,408
Pipe, black and galv., welded iron	1,688	273	7,862	3,832
Plain and galvanized wire	3,183	5,389	56,187	47,358
Barbed wire and woven wire products	2,093	5,264	38,581	37,771
Wire rope and other products	1,141	1,124	16,556	8,521
Nails and tacks	2,141	1,265	21,888	11,090
Bolts, nuts, rivets and washers except track	744	734	11,165	6,764
Other finished steel	268	231	2,963	2,181
Rolled and finished steel	191,442	117,996	2,125,157	1,040,346
Cast iron pipe and fittings	2,378	2,476	31,248	19,952
Malleable iron screwed fittings	266	380	5,383	3,657
Carwheels and axles	6,351	1,152	27,777	8,299
Castings, iron and steel	684	1,050	11,829	10,354
Castings, alloy steel, incl. stainless	144	...	1,647	...
Forgings, plain	646	413	9,149	3,859
Forgings, alloy steel, incl. stainless	119	...	933	...
Castings and forgings	10,588	5,471	87,966	46,121
Total	626,418	244,173	7,567,884	3,157,341

December Imports of Iron and Manganese Ores

(In Gross Tons)

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1937	1936	1937	1936
Canada	...	105	...	...
Cuba	22,000	33,000	5,306	5,289
Chile	119,685	107,100	...	...
Spain	...	...	...	...
Norway	21,203	20,837	...	...
Sweden	7,031	20,885	...	...
French Africa	...	...	...	...
Russia	...	...	18,064	15,663
India	...	...	523	8,559
Brazil	...	...	...	3,885
Gold Coast	...	...	14,022	11,744
Other countries	11,502	6,584	...	17
Total	181,421	188,511	37,915	45,157

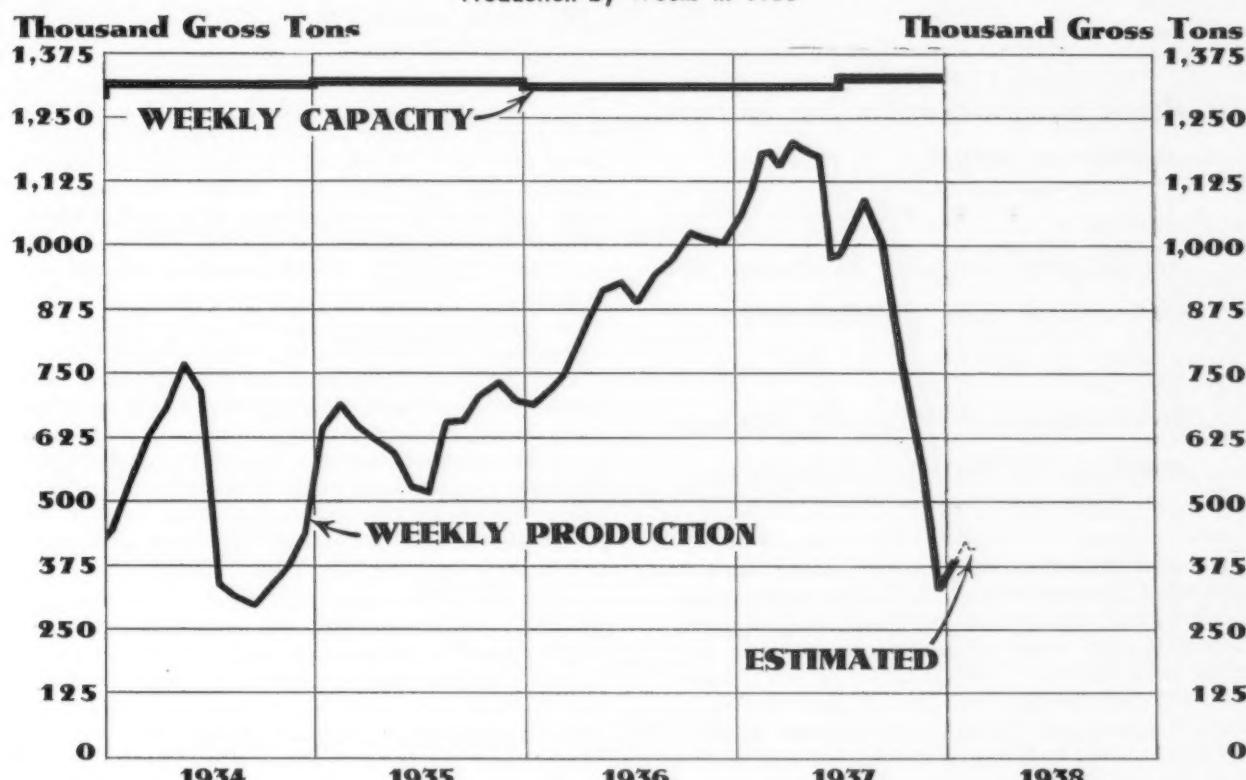
United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	Twelve Months Ended December		December	
	1937	1936	1937	1936
United Kingdom	...	...	100	5,286
British India	6,460	4,750	69,621	55,527
Germany	...	...	200	4,749
Netherlands	2,502	1,898	28,772	60,363
Canada	166	367	6,638	10,671
France	...	...	...	...
Belgium	...	...	...	973
Norway	...	100	875	2,649
Sweden	...	...	600	689
Russia	...	3,108	4,581	24,556
All others	...	...	...	446
Total	9,128	10,423	111,697	165,909

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1938



. . . . SUMMARY OF THE WEEK. . . .

▼ ▼ ▼

... Price announcement for second quarter expected.

• • •

... No general revision expected despite cut in cold rolled sheets.

• • •

... Steel consumer sitting on sidelines awaiting further developments.

AN announcement of steel prices for the second quarter is expected momentarily from United States Steel Corp. subsidiaries, following the wage agreement arrived at last week with the Steel Workers Organizing Committee. Despite the widespread disturbance of market conditions caused by the break of \$4 a ton in prices of cold rolled sheets, coming almost simultaneously with the wage agreement, there is no indication of a downward revision of steel prices generally. On the contrary, it is expected that nearly all present prices will be reaffirmed for the next quarter, with the possible exception of some adjustments to iron out the price relationships of sheet mill products closely allied with cold rolled sheets.

The reduction in prices of cold rolled sheets was precipitated, it appears, by the offer of one mill to furnish hot rolled annealed, pickled and oiled, sheets for certain automotive parts that had heretofore called for cold rolled sheets. This competitive situation was met by other steel producers in a reduction of \$2 a ton on mill-run cold rolled sheets and the elimination of the \$2 a ton oiling extra, a charge that had become superfluous on continuous mill sheets because of the oiling required in the rolling process. The price cut started with light sheets but has been extended to heavy cold rolled sheets. It puts some sheet prices out of alignment with each other; for example, hot rolled annealed, pickled and oiled, sheets of No. 20 gage are priced at 3.35c. a lb., the same as mill-run cold rolled sheets of No. 20 gage despite the admitted superiority of the cold rolled product. A reduction in the price of hot rolled annealed sheets would seriously affect the non-integrated mills unless they, in turn, received lower prices on sheet bars.

Although in the past a break anywhere in the steel price structure has often extended to other products, whether closely related or not, there is

under present conditions of rigid labor costs and high-priced inventories, surprisingly little sentiment in favor of general price revision either among steel producers or large consumers of steel. This is said to be true even in the automobile industry, where last week a price break occurred. There is still the fear that price revisions would cause wide repercussions, affecting wage rates and bringing about a further downward spiral.

While the contract entered into between the United States Steel Corp. subsidiaries and the Steel Workers Organizing Committee affords a loophole by which wages could be reduced within 20 days if conditions made this necessary, there seems to be no sentiment for wage reductions either among companies that have such labor contracts or those that have none.

In the present situation the steel consumer is sitting on the sidelines to an even more noticeable extent than during the past few months. Buying dropped perceptibly in many lines after the break in sheet prices, even in products where there has been no suggestion of a price change. Yet a clarification of the price situation may bring a mild improvement in steel buying for unquestionably a good many orders have been held back during the past few weeks, some for known and definite requirements. Moreover, there are signs of a slight seasonal betterment, such as a moderate gain in automobile assemblies and the partial breaking up of the used car jam. However, automobile companies still have ample stocks of steel, sufficient for 30 to 60 days, depending upon production gains. Steel operations for the country this week are unchanged at 31 per cent.

INDUSTRY is awaiting announcement of a freight rate increase, expected within two or three weeks, which may release some railroad buying. The Milwaukee road has asked approval of a \$3,000,000 expenditure for equipment. Lettings of steel for building construction are in light volume and are mostly for publicly financed work.

Export business continues in fairly good volume while the Steel Export Association of America is trying to work out export quotas, in cooperation with the international steel cartel, covering about a dozen products in addition to pipe and tin plate, which have been "cartelized" here for some years.

Scrap markets are weaker, No. 1 heavy melting steel having declined 25c. a ton at Pittsburgh, bringing THE IRON AGE composite price down to \$13.83, a decline of 17c. from the January level. The European scrap cartel may not buy here for several months, reflecting an easing in the European steel situation.

...PITTSBURGH...

...Buying slowed up by sheet price cut.

• • •

...No indication of general price revision.

• • •

...Operations lower in Pittsburgh, up two points in Wheeling-Weirton.

PITTSBURGH, Feb. 15.—The rate of incoming steel business has slowed up perceptibly during the past several days. This condition is directly attributable to last week's price cut on cold rolled auto body sheets.

An early reaffirmation of present steel prices for second quarter delivery, with the exception of cold rolled sheets, is expected to be made momentarily by at least one large steel company. Such a step was considered logical even before the flurry in cold rolled sheet prices, since this particular steel company has a signed contract with the Steel Workers Organizing Committee maintaining present wage scales, although a clause was inserted which made possible a change in wage rates within 20 days of notification of negotiations. Statements had previously been made that steel prices would not be cut without a reduction in wages. Some sort of adjustment is expected to be made on cold rolled sheets in order to retain a balanced sheet price structure. Despite the fact that recent price changes in cold rolled sheets had their origin with technological changes due to modern strip sheet mills, it is unfortunate for the industry that the matter broke when it did.

Many customers unfamiliar with the real facts are interpreting last week's happenings as the beginning of a general price reduction, although steel prices on other items have been holding exceptionally well in the face of pressure and low steel operating rates.

The cold rolled sheet situation last week was evidently precipitated when a condition arose where a steel maker offered hot rolled annealed single pickled sheets to be used on certain automotive parts which heretofore

called for cold rolled sheets. This resulted in other steel makers meeting this competitive situation by reducing cold rolled sheets \$2 a ton and eliminating an oiling charge of \$2 a ton. However, this oiling charge has in the past several weeks been interpreted rather loosely inasmuch as most cold rolled sheets require oiling for protection during shipment. Certain gages of hot rolled annealed single pickled sheets are now on a price parity with No. 20 gage mill run cold rolled sheets.

Summing up the situation, there has been little to really affect the price structure of all steel products. A check within the past few days discloses that weakness in wire products is restricted to secondary markets, where jobbers are getting rid of excess stocks of odd sizes and grades. A rather weak situation is indicated in the galvanized sheet market but this has been the case for the past several years. Concessions beyond published functional and quantity discounts on roofing items are not numerous and most of the shadings involve material which is not up to standard quality or size or represent concessions coming from jobbers alone.

Nevertheless many customers have pulled in their horns and are awaiting developments. The anticipated reaffirmation of steel prices may return market conditions to those which prevailed previous to the cold rolled sheet price revision.

Steel making operations in the Pittsburgh district have declined two points to 29 per cent of capacity, while the Wheeling-Weirton district is up two points to 62 per cent. Operations continue irregular.

No. 1 heavy melting steel is off 25c. a ton on sentiment.

Pig Iron

Fresh business is scarce and customers are still buying on a carload lot basis. No change in the current rate of business is expected in the near future.

Semi-Finished Steel

The volume of bookings for semi-finished steel has declined some during the past several days. Many customers are depending entirely on their inventories and are awaiting price announcements for second quarter delivery. No change from present quotations is anticipated.

Bars

Sales of hot rolled bars in the aggregate are off slightly from a week ago with little or no automotive buying in evidence. Most orders are for fill-in requirements and emanate from miscellaneous sources. In view of no change in labor costs it is expected that present prices will be reaffirmed for second quarter delivery.

Reinforcing Bars

Both specifications and new projects have slowed up somewhat during the past few weeks. Southern States Steel Co., Madison, Ill., is low bidder on a Bureau of Reclamation project at Blairstown, Ariz., Rutledge, Tex., and Phoenix, Ariz., involving 1380 tons.

Plates and Shapes

Plate and shape specifications are holding up well and are furnishing major support to local operating rates. Inquiries and awards are about on a par with a week ago. There is a good possibility that one maker will reaffirm present prices for second quarter delivery in the near future.

Tin Plate

Tin plate specifications are about on a par with a week ago, although a slightly better activity is indicated for the near future. Current business consists mostly of packers' specifications but some fill-in sizes have been ordered by general line can makers. Export business is also a factor. Tin plate operations this week are estimated at 43 per cent.

Wire

The volume of bookings during the past week has declined some owing to uncertainty surrounding steel prices. Nevertheless, jobber buying is fairly

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

	Feb. 15, 1938	Feb. 8, 1938	Jan. 18, 1938	Feb. 16, 1937
Per Gross Ton:				
Rails, heavy, at mill	\$42.50	\$42.50	\$42.50	\$39.00
Light rails, Pittsburgh	43.00	43.00	43.00	38.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	34.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	34.00
Slabs, Pittsburgh	37.00	37.00	37.00	34.00
Forging billets, Pittsburgh	43.00	43.00	43.00	40.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	43.00
Cents	Cents	Cents	Cents	
Skelp, grvd. steel, P'gh, lb.	3.10	3.10	2.10	1.80

Finished Steel

	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.20
Bars, Chicago	2.50	2.50	2.50	2.25
Bars, Cleveland	2.50	2.50	2.50	2.25
Bars, New York	2.79	2.79	2.79	2.55
Plates, Pittsburgh	2.25	2.25	2.25	2.05
Plates, Chicago	2.30	2.30	2.30	2.10
Plates, New York	2.54	2.54	2.54	2.33
Structural shapes, P'gh	2.25	2.25	2.25	2.05
Structural shapes, Chicago	2.30	2.30	2.30	2.10
Structural shapes, New York	2.5125	2.5125	2.5125	2.3025
Cold-finished bars, P'gh	2.90	2.90	2.90	2.55
Rot-rolled strips, P'gh	2.40	2.40	2.40	2.15
Cold-rolled strips, P'gh	3.20	3.20	3.20	2.85
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.80
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.90
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.40
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.50
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.15
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.25
Cold-rolled sheets, No. 20, Pittsburgh	3.45	3.55	3.55	3.25
Cold-rolled sheets, No. 20, Gary	3.55	3.65	3.65	3.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.65
Barbed wire, galv., P'gh	3.40	3.40	3.40	2.75
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.80
Tin plate, 100 lb. box, P'gh	\$5.35	\$5.35	\$5.35	\$4.85

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

Feb. 15, 1938
One week ago
One month ago
One year ago

2.605c. a Lb.
2.605c.
2.605c.
2.330c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	HIGH	LOW
1937	2.605c., Mar. 9	2.330c., Mar. 2
1936	2.330c., Dec. 28	2.084c., Mar. 10
1935	2.130c., Oct. 1	2.124c., Jan. 8
1934	2.199c., Apr. 24	2.008c., Jan. 2
1933	2.015c., Oct. 3	1.867c., Apr. 18
1932	1.977c., Oct. 4	1.926c., Feb. 2
1931	2.037c., Jan. 13	1.945c., Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9
1929	2.317c., Apr. 2	2.273c., Oct. 29
1928	2.286c., Dec. 11	2.217c., July 17
1927	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
20.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
1937	\$23.25, Mar. 9	\$20.25, Feb. 16
1936	19.73, Nov. 24	18.73, Aug. 11
1935	18.84, Nov. 5	17.83, May 14
1934	17.90, May 1	16.90, Jan. 27
1933	16.90, Dec. 5	13.56, Jan. 3
1932	14.81, Jan. 5	13.56, Dec. 6
1931	15.90, Jan. 6	14.79, Dec. 15
1930	18.21, Jan. 7	15.90, Dec. 16
1929	18.71, May 14	18.21, Dec. 17
1928	18.59, Nov. 27	17.04, July 24
1927	19.71, Jan. 4	17.54, Nov. 1

Steel Scrap

\$13.83 a Gross Ton
13.92
14.00
13.25

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1937	\$21.92, Mar. 30	\$12.92, Nov. 16
1936	17.75, Dec. 21	12.67, June 9
1935	13.42, Dec. 10	10.33, Apr. 23
1934	13.00, Mar. 13	9.50, Sept. 25
1933	12.25, Aug. 8	6.75, Jan. 3
1932	8.50, Jan. 12	6.43, July 5
1931	11.33, Jan. 6	8.50, Dec. 29
1930	15.00, Feb. 18	11.25, Dec. 9
1929	17.58, Jan. 29	14.08, Dec. 3
1928	16.50, Dec. 31	13.08, July 2
1927	15.25, Jan. 17	13.08, Nov. 22

stable as the latter's stocks are practically depleted and there is some evidence that spring demand will practically force wire customers into the market. Meanwhile, most buyers are awaiting price announcements, which are expected to reflect no change from present quotations.

Sheets and Strip

The reduction last week of \$2 a ton on cold rolled sheets and the elimination of a \$2 a ton oiling charge by most steel makers to meet a competitive situation has in no way affected so far the price structure of other sheet products. Some adjustment is expected to be made momentarily by at least one large maker, which will clarify the situation and put the sheet price structure back in balance. Although sheet prices continue firm at the moment, new business is at a virtual standstill while buyers await developments.

Tubular Goods

The volume of tubular goods sales is unchanged from a week ago. No small part of present pipe production is for mill and warehouse stocks. Oil country goods specifications continue to be composed of small fill-in requirements as most oil companies have not yet completed 1938 drilling plans.

Public Construction Shows Gain in January

FOR the third consecutive month, the volume of public construction in January exceeded the total of the preceding month. Contracts for public projects awarded during January totaled 120,842,000, 5 per cent greater than December, 1937, and 8 per cent above January, 1937, according to F. W. Dodge Corp.

Total construction contracts for both private and public work awarded in January in 37 Eastern states amounted to \$195,472,000, as compared with \$209,452,000 in December, 1937, and \$242,719,000 in January a year ago.

In addition to the increase in public construction, the volume of contemplated new work, particularly in the residential classification, has shown continued improvement during the past two months. For January, contemplated construction of all types amounted to \$474,205,000, as compared with \$359,365,000 for the preceding month and \$412,680,700 for January of last year.

Japanese Tool Importers Fight Restrictions

JAPANESE machine tool importers are vigorously opposed to the attitude of the Finance Ministry with regard to the licensing of machine tool imports, according to the American Commercial Attaché at Tokio, as reported in the January issue of *World Machinery News*, published by the Bureau of Foreign and Domestic Commerce.

The policy of the Ministry has been to license only those tools which are essential for the munitions industries and even some of those have been refused permits. The importers feel that inasmuch as Japanese production is far below the demand, which is now temporarily very great, the authorities are encouraging a situation which will bring about over-production in the future. They further believe that the Ministry is seriously crippling other expanding industries including the munitions industries, which are certainly as important as maintaining the value of the yen, by causing a shortage of machine tools. Japanese manufacturers, on the other hand, feel that this is the time to encourage machine tool manufacturers to raise the technical standard and output of the Japanese products.

Incidentally, because Japanese machine tool builders are not in a position to take orders, the South Manchuria Railway Co. has dispatched two engineers to Germany where it plans to buy a large number of machine tools.

Industrial Advertisers' Committees Appointed

CLEVELAND.—Appointments of seven committees for the 16th annual conference of the national Industrial Advertisers Association, which will be held in Cleveland, Sept. 21 to 23 inclusive, have been announced by Stanley A. Knisely, director of advertising, Republic Steel Corp., who is vice-president of the association and general conference chairman.

The following men have been appointed to work with Mr. Knisely on the general conference committee: Paul Teas, Paul Teas, Inc., Cleveland; George H. Corey, Cleveland Twist Drill Co., Cleveland; R. P. Dodds, Truscon Steel Co., Youngstown; Richard C. Carr, Meldrum &

Fewsmith, Inc., Toledo; and H. E. Van Petten, B. F. Goodrich, Akron, Ohio.

Louis J. Ott, Ohio Brass Co., Mansfield, Ohio, will be chairman of the hotels committee, assisted by: George H. Corey, Cleveland Twist Drill Co., and Kenneth H. Akers, Griswold-Eshleman Co., Cleveland.

Ralph Leavenworth, Fuller & Smith & Ross, Inc., Cleveland, will be chairman of the program committee; H. W. Fortey, Warner & Swasey Co., Cleveland, chairman of the entertainment and banquet committee; E. L. Oldham, Cleveland Rock Drill Co., chairman of the publicity committee; J. L. Beltz, Thew Shovel Co., Lorain, Ohio, chairman of the exhibits committee; R. E. Bandelow, The Caxton Co., Cleveland, chairman of the membership panels committee and H. E. Melville, Simmons-Boardman Publishing Co., chairman of the transportation committee.

E. B. Bossart, Bailey Meter Co., Cleveland, has been appointed chairman of the attendance promotion committee. He will be assisted by: W. S. Leech, G. M. Basford Co., Cleveland, and Harry I. Berle, Direct Mail Service, Cleveland.

Headed by Frank O. Wyse, advertising manager, Bucyrus Erie Co., South Milwaukee, Wis., as president, the N.I.A.A. conferees will come to Cleveland more than 1200 strong, representing active chapters in 15 cities of United States and Canada.

Tube and Tin Plate Cartels Announce Price Decisions

LONDON (By Mail).—At the meeting of the International Tube Convention, held in Dusseldorf early in February, it was decided to make no general alteration in existing price levels.

Certain changes, however, were made, mainly in galvanized tubes, owing to the fact that the previous difference between black and galvanized was based on a higher figure for spelter than that ruling.

Other reductions were made in a small number of markets with the intention of meeting growing outside competition. It is stated that the agreement remains firm and that the convention members intend to shape their policy to deal with competition as and when it arises.

It is announced from Paris that the International Tin Plate Cartel has also decided to maintain prices at their current levels.

• . . . CHICAGO

... Ingot production gains slightly.

• • •

... Price cut on sheets adds to buyers' caution.

• • •

... Milwaukee Road to spend \$3,000,000 for equipment.

CHICAGO, Feb. 15.—A fractional increase in operations at a leading district mill and drop at a smaller district mill result this week in a one-point gain in ingot output to 25 per cent of capacity. A blast furnace at the Inland Steel Co. was blown out last week, 12 furnaces remaining in blast in the Chicago area.

Varied reactions to last week's price reduction on cold-rolled sheets are being heard. In some circles it is said that certain consumers resent not being favored with a similar cut in other steel products, while from elsewhere comes the word that the automobile industry itself, which stands to benefit more than any other from the recent decrease of \$4 a ton, resents the lower figure because of the inventory losses which are incurred.

No seller here expected much of an increase in orders for cold-rolled sheets because of the cut, and none has been seen. The effect on sales of plates, shapes, bars, wire, etc., has been normal as compared with past instances in that more reluctance to buy is being expressed now than before the reduction because of the ever-present possibility of additional downward revisions of the price structure.

Regarding this eventuality, however, a high official of a leading producer here said this week that his company did not intend to inaugurate further price changes, although it would make any necessary adjustments to meet a competitive situation. It is also understood with reference to wages that this particular mill will maintain the same wage standards as its competitors. Since in this district the only set wage minimums are those agreed to by United States Steel Corp. subsidiaries, in their union contracts, this

statement is taken to imply that the base rate for common labor will continue at \$5 until changes are made in the union agreements.

Sales are continuing about even with the average for the year, the bulk of the tonnage being miscellaneous orders and no one consuming group being outstanding. Implement manufacturers are said to be operating at about 75 per cent of capacity, while makers of farm tractors also have substantial programs before them. No upturn in specifications for the automobile industry has been reported, and with the exception of the Milwaukee's proposed building of 55 passenger and 464 flat cars, and purchase of four locomotives, little business is in sight from the railroads. No rails have been ordered for several weeks, but it is believed that a few Western roads are on the verge of placing rail tonnages. The Milwaukee Road's inquiry Monday for about 20 pieces of machinery for shop use is the largest machine tool list from a railroad for several months.

Present price uncertainties are stimulating warehouse sales in that buyers are hesitating more than ever before placing orders in advance. Continuation of low operating schedules enables purchases in warehouse quantities to be made more conveniently.

Steel scrap prices are nominal and unchanged, No. 1 steel being quoted at \$12.50 to \$13 a gross ton.

Pig Iron

One of the three blast furnaces operating at the Inland Steel Co. was blown out last week, 12 furnaces remaining in blast in the district. Shipments of iron and foundry coke are

little changed from last week, increases over last month of only a few tons being registered in each case. Some sellers believe that a rate increase for the railroads will result in a considerable amount of buying for before the effective date of the rise so as to save the additional freight charge.

Structural Shapes and Bars

The largest project outstanding in the shape market is the Clarksville, Mo., dam involving more than 4000 tons of shapes and 570 tons of bars, bids to be taken Feb. 18. The Dodge Street bridge at Omaha, which, according to plans, would require several thousand tons of shapes, is still in the formative stage, and no other similarly large work is pending. State highway construction is fairly plentiful but private jobs are few.

Sheets

The \$4 a ton reduction in the price of cold rolled sheets has not made an appreciable difference in the rate with which orders are being received. Deliveries continue unchanged at two to three weeks for cold rolled and hot rolled annealed, one to two weeks for hot rolled, and three weeks for galvanized and enameling stock.

Plates

Universal and sheared plates still are being quoted for shipment in one week to 10 days, no outstanding demand being evident at present. The Milwaukee's application for permission to issue equipment trust certificates for the construction of 55 passenger and 464 flat cars is the major railroad item current. Steel requirements for new locomotives for this road were reported last week. The American Rolling Mill Co. has been awarded 700 tons of light plates for pipes and pontoons in Louisiana.

Wire and Wire Products

The normal volume of buying from the rural districts for this season of the year has not yet been reached, but it is the opinion of wire sellers here that if jobbers in the outlying areas wish to remain in business they must replenish their stocks quickly for

present steel supplies are inadequate to accommodate the demand that is usually seen in the spring. It is believed that political and price uncertainties are the main factors deterring buying now, especially the latter.

.CAST IRON PIPE..

Houston, Tex., will take bids soon for cast iron pipe, fittings and hydrants for extensions in water system. Cost about \$47,600.

Clay City, Ill., plans pipe lines for water system and other waterworks installation. Cost about \$75,000. Russell & Axon, 4903 Delmar Street, St. Louis, are consulting engineers.

Bellflower Water Co., Bellflower, Calif., plans pipe lines for extensions and replacements in water system. Company has levied an assessment on stockholders to provide funds. A. A. Diederich is secretary.

Opelousas, La., closes bids Feb. 21 for pipe lines for extensions in water system in connection with new filtration plant, for which bids are being received at same time. George P. Rice, Baronne Building, New Orleans, is consulting engineer.

Wallace Brooks, president, Brooks Equipment & Mfg. Co., 1840 Terrace Avenue, Knoxville, Tenn., has applied to State Public Utilities Commission for permission to install pipe lines for water system and other waterworks equipment at Gatlinburg, near Sevierville, Tenn.; also for sewage system at same place. Entire project will cost about \$300,000. Work is scheduled to begin soon. Campbell Wallace, Empire Building, Knoxville, is engineer.

Topeka, Kan., plans about 25 miles of pipe lines for water system in Highland Park, Pierce and East Hill districts; also installation of pumping station, elevated steel tank and tower, and other waterworks equipment. Cost about \$350,000. Financing is being arranged through Federal aid. W. E. Baldry is city engineer.

Bucklin, Mo., has awarded contract for a waterworks system and fire department building to Fleming & Kilgo, Alton, Ill., at \$59,680, subject to WPA approval.

Jeffersonville, Ohio, has placed 125 tons of 4 and 6-in. cast iron water pipe with J. B. Clow & Sons, Cleveland.

West Unity, Ohio, has taken bids on 350 tons of cast iron pipe.

Board of Polk County Supervisors, Des Moines, Iowa, plans pipe lines for water system in recently created District No. 2, a residential section in Fort Des Moines area.

Board of Tulsa County Commissioners, Tulsa, Okla., plans water system in Water Improvement District No. 9, Craig & Burnham, Tulsa, are consulting engineers.

Twin Falls, Idaho, plans main pipe line from Rock Creek Canyon to municipal filtration plant for water supply. Cost about \$51,000, of which municipality will furnish \$28,000 and remainder secured through Federal aid.

Sheffield, Ala., plans extensions and replacements in water pipe lines; also other waterworks improvements. Fund of \$23,000 has been secured through Federal aid. Lide & Adler, Woodward Building, Birmingham, are consulting engineers.

Canton, Ohio, plans early call for pipe for extensions in water system, including replace-

ments of several existing lines with larger size pipe. Cost close to \$125,000.

Kirksville, Mo., asks bids until Feb. 24 for pipe for extensions in water system; also for other waterworks equipment, including water treatment plant. Cost about \$60,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

King County Water District No. 3, Seattle, has opened bids on 321 tons of 4 and 6-in. pipe and fittings.

Twisp, Wash., closes bids Feb. 21 on water system improvement requiring 192 tons of 4, 6 and 8-in. pipe.

Steel Export Quotas Nearly Completed

A MEETING of members of the Steel Export Association of America was scheduled for Wednesday of this week (after THE IRON AGE had gone to press) at which it was expected that final details would be completed on export quotas under the agreement with the International Steel Cartel. Little difficulty has been experienced in making up quotas except on sheets, and the Wednesday meeting was called to make the final adjustments on that product.

The products that have been "cartelized" are the following: Semi-finished steel, including billets, sheet bars, skelp and wire rods; plates, shapes and bars, hot rolled and cold rolled strip, hoops and bands and wire products. In the sheet classification are hot rolled and cold rolled sheets and galvanized sheets.

Quotas for Canada have been set up apart from those which will govern exports to other countries.

All quotas are based on the shipments of various products by the companies concerned during 1936.

U.S. Steel Shipments Advance 6 Per Cent

SHIPMENTS of finished steel products by subsidiary companies of the United States Steel Corp. in January were 518,322 tons, an increase of 6 per cent over December,

1937, and the first advance after nine months of consecutive declines. Shipments in January, 1937, were 1,149,918 tons.

The January shipments represented 34 per cent of the corporation's producing capacity, as compared with 32.1 per cent in December, 1937, and 75.4 per cent in January a year ago.

MONTHLY SHIPMENTS OF FINISHED STEEL PRODUCTS BY UNITED STATES STEEL CORP.—TONS

Month	1934		1935		1936		1937		1938	
	Ship- ments	Per Cent of Capacity								
January	331,777	19.8	534,055	31.9	721,414	44.8	1,149,918	*75.4	518,322	34.0
February	385,500	25.9	583,137	39.2	676,315	45.3	1,133,724	82.5	...	...
March	588,209	35.2	668,056	41.5	783,552	50.5	1,414,399	92.7	...	...
April	643,009	41.5	591,728	36.7	979,907	63.2	1,343,644	91.0	...	...
May	745,063	44.5	598,915	35.8	984,097	63.4	1,304,039	85.5	...	...
June	985,337	61.2	578,108	36.7	886,065	57.1	1,268,550	85.8	...	...
July	369,938	23.9	547,794	34.0	950,851	61.3	1,186,752	77.9	...	...
August	378,023	22.6	624,497	37.3	923,703	59.6	1,107,858	72.6	...	...
September	370,306	23.9	614,933	39.7	961,803	62.0	1,047,962	71.1	...	...
October	343,962	20.6	686,741	41.1	1,007,417	62.6	792,310	52.0	...	...
November	366,119	22.7	681,820	42.3	882,643	59.2	587,241	39.7	...	...
December	418,630	27.0	661,515	42.7	1,067,365	68.8	489,070	32.1	...	...
Minus yearly adjustment	(-19,907)	...	(-23,750)	...	(-40,859)	...	...	...	...	...
Total for year	5,905,966	30.6	7,347,549	38.1	10,784,273	58.2	12,825,467	71.5	...	...

*Annual capacity 17,929,400 gross tons, with monthly percentages based on actual number of weeks in each month.
†Subject to yearly adjustment.

• • • CLEVELAND • • •

... Operations in Valley up two points to 28%.

• • •
... Consumers buy sparingly, awaiting price developments.
• • •

... Spring trend developing but may be slow.

CLEVELAND, Feb. 15.—While operating schedules of the various individual mills continue to fluctuate from week to week, average ingot output by districts has been maintained fairly well between the levels of 25 and 30 per cent. This week open hearth operations in the Cleveland-Lorain district are unchanged at 27 per cent, while the Valleys district is up two points to 28 per cent.

Anticipating price announcements covering principal products, consumers have been buying only sparingly. Advantages of clarification are numerous and readily welcomed on all sides, especially since some erroneous ideas were stirred up by the wide publicity accompanying last week's reduction in cold rolled sheets. In general, however, the decision reached at the New York wage conference led a majority of sellers and buyers to look for reaffirmation of many present prices.

The \$2 cut Feb. 9 in the base price of cold rolled sheets and the elimination of the \$2 oiling extra brought out very little additional business for mills. Cold strip sellers anticipated pressure, but encountered only a comparatively mild reaction here. An attempted adjustment of practices somewhat along the line undertaken had been looked for by some persons. Only a few days after this development speculation arose concerning the possibility that restoration of the base price which prevailed prior to Feb. 9 might be attempted for second quarter.

Meanwhile, several developments have led to a slightly better feeling. Automobile dealers in this vicinity report improvement in used car sales. Refrigerators and other electrical appliances are moving a little better than a month ago. The customary spring seasonal upturn in construction, consumption of wire products and other lines is approaching, although from present indications this year the spring trend may be slow in developing.

Hand-to-mouth buying remains the general practice in regard to the raw materials. Large pig iron releases are infrequent and activity in scrap is very light. No. 1 heavy melting at Cleveland remains at \$12 to \$12.50 a ton.

Pig Iron

February releases remain close to the weekly levels prevailing during the latter part of January. Foundries which supply the automotive, railroad and farm equipment industries are taking iron on a hand-to-mouth basis. There has been little to test prices during the past three months and hardly any pressure for lower levels recently, a number of consumers being anxious for stabilization.

Iron Ore

Shipments of Lake Superior iron ores from Lake Erie ports to interior furnaces totaled only 84,523 tons during January, compared with 114,174 tons in December and 586,871 tons in January, 1937. The dock balance Feb. 1 was 5,874,757 tons against 3,761,226 tons on the same date one year ago. Shipments for the season through January totaled 30,727,144 tons compared with 24,658,750 tons in the previous season.

Sheets and Strip

Stimulation of orders resulting from the reduction in cold rolled sheet prices has been negligible so far. Many consumers have been waiting for an announcement on second quarter prices and biding their time until the entire situation is ironed out. While sellers of cold rolled strip expected to encounter pressure as a result of the cold reduced sheet situation, very little reaction has been noted. On the basis of last week's change, prices on pages 17 to 22 are the same for mill run cold rolled oiled sheets as for hot rolled pickled and

oiled, which creates complications for the hot mill producers.

Wire

Pending the expected announcement of wire prices for the second quarter, some consumers have been hesitant to order for other than their most pressing needs recently. Producers are uncertain as to the extent of the gains which might be expected in the early part of the second quarter, although the usual spring pickup can be counted upon to help.

Bars, Plates and Shapes

Awards and inquiries remain light in these three products. A conference with PWA officials this week apparently has paved the way for a start on the new Main Street bridge in Cleveland, largest project in this vicinity, requiring around 9000 tons of structural shapes alone. The river piers which will be let first call for around 200 tons of reinforcing bars. Among Ohio structural awards of the past week was 282 tons for the City of Columbus boiler plant, awarded to Case Crane & Kilbourne-Jacobs Mfg. Co., Columbus. Jeffersonville, Ohio, has awarded 100 tons for a steel water tank to Pittsburgh-Des Moines Steel Co., Neville Island, Pa.

• • • CINCINNATI • • •

... Sheet bookings improve partly in export field.

CINCINNATI, Feb. 15.—Finished sheet demand is holding recent gains. Bookings the past week were at about 40 per cent of current capacity. A fair amount of recent bookings was for export, but the domestic share is slightly better than the early-year average. Automotive specifications continued to be disappointing. Prices on cold rolled sheets were reduced \$2 a ton, the past week, and the oiling extra of \$2 a ton was eliminated.

Open hearth operations are down to less than 30 per cent. Ten out of 34 open hearths are now in operation, with prospects of one or two additional being put on the latter part of this week.

Pig iron continues sluggish. Only spot orders are being received, but specifications against contracts tend to expand as foundry inventories are depleted. The melt is not substantially changed and foundries operate just a few heats a week. The Wheeling Steel Corp. is to blow in one blast furnace today.

. . . BIRMINGHAM . . .

Operations in steel and pig iron unchanged.

BIRMINGHAM, Feb. 15.—There is little change in the iron and steel situation. Operations this week will be the same as last, with 12 open hearths and 11 blast furnaces in production. Market activities, for both iron and steel, are limited, with demand light and shipments also slow. New bookings, as well as specifications against contracts, are small. Railroad purchases have apparently stopped, and a resumption is not looked for until after a freight rate increase. The railroads have covered their needs for the present and are marking time.

Tennessee Coal, Iron & Railroad Co. announced last week that it would reopen its red ore mines No. 4, 5, 9, 10 and 11 on March 1. These mines were closed the latter part of January and will be idle for about six weeks. Production of raw materials is being adjusted to current requirements. The reopening does not indicate an increase in operations.

Chicago Bridge & Iron Co. is to furnish 300 tons of steel plates to the Western Pipe & Steel Co., California, for equipment for the Grand Coulee Dam.

CANADA

Dominion steel industry working at steady pace.

TORONTO, Feb. 15.—Announcement is made that the Canadian National Railways has placed an order for six dining cars and 10 cafe sleepers with the Canadian Car & Foundry Co., Montreal, representing an expenditure of \$1,150,000. This is the first railroad equipment order that has been placed this year by the C.N.R., and it is expected that others will follow immediately. Awards by the Canadian Pacific in connection with its \$10,000,000 proposal for equipment, on which bids were asked a couple of weeks ago, have not yet been announced.

Ross McMaster, president of the Steel Co. of Canada, Ltd., Hamilton, Ont., in a letter to shareholders states that steel ingot production in 1937 was the highest in the company's history. Operations continued to capacity until early in December, and the volume of

new business has been at a very satisfactory level. A number of changes have been and are being made at the Hamilton works. In order to increase the rolling mill capacity to conform with increased steel production, it has been necessary to replace the existing ingot heating furnaces with a complete new installation.

Hamilton Bridge Co., Hamilton, Ont., has received a contract for 1000 tons of steel for the Halnor Mines in the Porcupine area, controlled by Noranda Mines, Ltd., Toronto.

Inquiries for foundry pig iron are appearing regularly and current demand for spot delivery ranges from a car to 500 tons. Pig iron production continues at its recent level, with six stacks in blast. Prices are firm.

Comparatively little scrap is moving into dealers' yards owing to the low offering prices and the fact that supplies in the rural districts still are inaccessible owing to heavy snow. Mills in the Hamilton district are taking heavy melting steel and turnings as offered by local dealers but are not pressing for deliveries.

. . . BOSTON . . .

Pig iron sales small; foundry operations slow.

BOSTON, Feb. 15.—Furnaces are picking up an order for a car of pig iron now and then. Sales the past week included one 100-ton lot and enough carlots to bring the aggregate up to not more than 500 tons. Indian, Buffalo and charcoal irons figured in transactions. Charcoal iron is \$35.47 a ton landed in New England. The melt in these states is just about on a par with that for 1930, 1931 and 1932, or in other words at about 15 to 17 per cent of rated capacity. With business conditions as they are, social security is becoming more and more a burdensome factor, and unless things improve several foundries report they will have to go out of business.

General trade conditions in New England, with the possible exception of the shoe manufacturing and leather industries, are gradually contracting, although large department stores report a slight pickup in business. Now that the New Haven Railroad has been granted permission to remodel 50 New York, Westchester & Boston Railroad cars, and 100 old New Haven standard steel coaches, the company's car repair shops will increase operations.

. . . BUFFALO . . .

School buildings prominent in new structural work.

BUFFALO, Feb. 15.—Steel fabricators are interested in a number of new jobs coming out. Most of them are for schools, but the list is interspersed with several private projects. Among the schools are the following: Salem, Ulster County, \$445,000; Highland, Ulster County, \$342,000; Fort Anne, Washington County, \$282,000; Hadley, Saratoga County, \$306,975; Brooklyn, \$307,600.

A warehouse will be built by J. G. Pieri & Co., Niagara Food Terminal, Buffalo. It will require about 100 tons of structural steel.

Two hundred tons of steel for additions to the Jesuit Shrine at Auriesville, N. Y., probably will be fabricated by a Buffalo concern, but announcement is being withheld until this week. The figures of this concern and two Utica fabricators are very close. Boehm Brothers, Buffalo, are general contractors.

A Buffalo fabricator took the contract for 200 tons of structural for a warehouse for the National Gypsum Co., Ft. Dodge, Iowa.

Steel warehouses have reduced prices on cold rolled sheets \$4 a ton, following the action of the mills.

While Bernard J. Yungbluth, president of the International Railway Co., owners of the collapsed Niagara gorge bridge, announced plans for the building of a new single-deck span to cost \$1,500,000, New York state and Ontario Legislators proceeded with plans for the appointment of commissions on either side of the border to cooperate in an arrangement for a public-owned bridge near the site of the collapsed arch.

The Robertson Contracting & Engineering Co. of Niagara Falls, under a contract with the I.R.C., is endeavoring to salvage portions of the wrecked steel structure which lies on the Canadian side of the gorge. A derrick had been installed on the 180-ft. cliff and a few tons of torched steel has been raised from the ice jam. The work was being hastened against the time softer weather would weaken the ice jam and allow the skeleton to drop to the bottom of the river.

Continental Metal Co., smelter and refiner, announces removal of its office and plant to 11500 Russell Street, Detroit.

... . . . NEW YORK. . . .

... . . . **Buying checked by sheet price decline.**

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... . . . **Buyers await clarification of situation.**

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... . . . **Export orders substantial; quotations stiffening.**

NEW YORK, Feb. 15.—The break last week in prices of cold rolled sheets has had the effect of checking even the small amount of business that had been available. Sheet orders were particularly affected, but the hesitancy among buyers extended even to other products on which there has been no suggestion of a price change. As one seller expressed it, "buyers have drawn more completely into their shells," with no prospect of crawling out until the price situation has again become stabilized. The tonnage booked by one representative office last week was only 30 per cent of that sold in the previous week.

It is expected that an announcement of second quarter prices will be made within a day or two. This may tend to stabilize the situation and let buyers know "where they are at." Assuming, for example, that present prices on all other steel products are reaffirmed, there is the question of straightening out the differentials on sheet products which have been upset by the cut of \$4 a ton on cold rolled sheets. The price of No. 20 gage mill run cold rolled sheets, oiled, is now 3.35c. a lb., Pittsburgh, which is identical with the price of No. 20 gage hot rolled annealed sheets, pickled and oiled. This places mills which depend largely on business in hot rolled annealed sheets in a disadvantageous position. However, if the price of hot rolled annealed sheets is reduced, they will still be in a like position. The non-integrated mills will be hardest hit unless they obtain lower prices on sheet bars. This question overtops all others at the moment in the steel situation.

Once equilibrium has been reestablished in prices, it is believed that business will improve. Some seasonal gains in buying are due, in addition to which is the fact that many consumers

are actually in need of steel, or will be soon.

Although domestic business is extremely dull, there has been a substantial amount of export buying, particularly by Japan. Export prices are stiffening somewhat as a result of recent cartel agreements.

Pig Iron

The reduction in cold rolled sheet prices has injected a fresh uncertainty into the minds of buyers in this district and has intensified their cautious attitude toward making commitments. Buying during the past week was extremely light, limited entirely to supplies required to sustain current operating rates. Shipments for the present month to date are about on par with January, but there has been a noticeable slackening in melting operations which will have an adverse effect upon shipments during the balance of the month. Foreign inquiry continues to dribble in but, outside of the recent Japanese purchase, little of this inquiry has resulted in actual sales.

Reinforcing Bars

Bids on most of the outstanding jobs have been closed and no new work of size is in sight. Due to

changes in design, specifications for the Veterans' Hospital at Lyons, N. J., are out for rebidding. The West Branch-Kensico section of the Delaware aqueduct, calling for 783 tons of bars, is also out for rebidding, the previous bids having been rejected. Small consumers have tuned their purchases more closely than ever to their actual requirements, and sales to this class buyers are the lightest they have been in several years.

Sheets and Plates

Panama Canal has so far been able to buy galvanized roofing material under the market. On the second lot, for which bids were closed Feb. 2, Newport Rolling Mill Co. was low bidder with a price of \$6.255 per square on 45,000 sheets of copper bearing corrugated roofing material. This lot is on Class 61, schedule 3325 and the quoted price is f.a.s. at Cristobal, Panama Canal Zone. Other mills quoted a price of \$6.51 on the same basis.

Plate business has been so low in recent weeks that it is difficult to point to any buyer hesitancy due to price uncertainty. There has certainly been no upward movement in buying, and fabricators that have contracts are buying for their immediate needs as they arise. The tonnages are all small, 40 tons being a large order these days.

A. W. Banko was low bidder with a price of \$377,000 on the Brooklyn water pipe line on Avenue P, consisting of 14,600 ft. of 60-in. welded steel pipe of $\frac{1}{2}$ -in. plate, approximating 3000 tons. Bids were opened Feb. 14 by the Department of Water Supply of New York.

C. W. Heppenstall Is Honored By Employees

PITTSBURGH.—The 600 employees of the Heppenstall Co. recently gathered at the company's plant to honor C. W. Heppenstall, 66, president and treasurer of the company, who has spent 45 continuous years with the firm and has been president since 1920.

Mr. Heppenstall is the fourth gen-

eration of his family to work in steel plants of England and America. The first Heppenstall found employment in a steel mill at Sheffield, England, in 1792. His son and a grandson followed him into the business. The grandson, Sam Heppenstall, migrated to America and to the steel mills of Pittsburgh. In 1889, he helped organize the Trethewey Mfg. Co., now the Heppenstall Co., which manufactures alloy and carbon tool steel and shear knives and die blocks.

• . PHILADELPHIA . .

... District operations unchanged at 29 per cent.

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... Sellers and buyers confused by price situation.

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... Warehouses drop galvanized quotations \$8 a ton.

PHILADELPHIA, Feb. 15.—The \$4 drop in full finished sheet prices has had no great direct effect in this territory, inasmuch as eastern Pennsylvania is not a major consuming area for this type of material. At the same time, however, there has been an indirect effect in that consumers are loath to commit themselves for new tonnages until the entire price structure is more adequately defined. There are many rumors floating around. Some sellers believe that cold-rolled sheet prices may actually be advanced \$2, whereas others are of the opinion that the \$4 decline will hold, and will be followed by at least minor revisions in certain hot-rolled grades and semi-finished steels. At the moment it seems unlikely that tin plate will weaken or that pig iron will slide off, although in the latter instance there is some consumer resentment arising from the very low price level at which some Japanese export business recently was taken.

Although much buying is being held in abeyance until the price situation clarifies, it is encouraging to note that the volume of orders currently passing through district sales offices is undergoing a steady, if not spectacular, improvement. There is every good reason to hope that the improvement will be maintained and even accelerated during the next fortnight, and once the ICC comes through with a railroad rate decision (probably 10 per cent) the carriers are practically committed to discard their present inertia.

Warehouses here continue to operate at greatly reduced capacity. Reductions in cold-finished sheets have been made in accordance with reductions in mill prices, and, in addition, galvanized sheets have been marked down \$8 a ton without benefit of a concomitant reduction in mill prices. Warehouses are if anything overstocked and have every reason to hope for no serious additional changes in mill prices, otherwise they will be faced with heavy inventory losses.

Open-hearth operations in the eastern Pennsylvania district are prac-

tically unchanged from the previous week, which is in the neighborhood of 29 per cent of potential capacity. Indications are that there will be no rise next week, but some operators are hoping to step up schedules moderately within the next three weeks.

Pig Iron

Shipments so far this month are in slightly better volume than for the corresponding period a month ago. However, turnover is still far from satisfactory, and for the most part is confined to spot demand for prompt shipment. Sellers look for no significant improvement for some time, probably a month or more. Melters admit that the current price structure is very steady, but there is considerable comment regarding recent export sales which have been reported at an extremely low price. Most sellers, on the other hand, insist that the few export orders taken recently are not indicative of the position of the pig iron trade as a whole, and point out that there has been plenty of export inquiry at low prices which has not been considered seriously by furnaces in this area.

Sheets and Strip

The \$4 decline in cold rolled sheet prices brings this grade of material practically on a parity with certain sizes of hot rolled pickled material. Such a situation seems unlikely to be maintained for any great length of time, but on the other hand a drop in hot rolled prices would be severe on many producing units, as for instance those small plants not equipped with continuous mills. And, also, a drop in hot rolled material without a concomitant drop in semi-finished would exert hardship on non-integrated units. The situation remains complex, therefore, and there is even some talk that cold rolled may be advanced \$2 a ton. In any case the whole situation should be clarified within a week, which will be a desirable thing inasmuch as some business has been held up because of market confusion. Automobile releases are improving slightly, and miscellaneous demands are ex-

pected to show a better demand over the next month. Warehouses are still overstocked in most sheet and strip gages, and radio and stove makers will probably be of little support until the middle of the summer.

Plates and Shapes

It is unlikely that prices for shapes or plates will undergo any downward revision, as there is little tonnage in prospect that would justify cutting. Also, the only major tonnage coming up here is for ship work, and it is unlikely that any mill will obligate itself for large tonnages for two years or more at prices under those ruling today. The plate market is currently practically dead, with nothing in prospect to inject much immediate encouragement into the situation. Several of the larger producers have taken the bulk of pending ship tonnage, and miscellaneous demands are currently of little or no moment. Private construction continues to remain under cover, and the only support to the shapes market is a scattered amount of State work. There was no award during the week, but about 20,000 tons of work is either under consideration or has already been bid, and distribution of this tonnage should gain momentum over the next fortnight.

Imports

The following iron and steel imports were received here during the past week: 970 tons of chrome ore from the Philippine Islands; 100 tons of pig iron from the Netherlands; 6 tons of steel bands, 102 tons of steel sheets, 11 tons of steel bars and 12 tons of structural shapes from Belgium; 10 tons of structural shapes from France.

RAILROAD BUYING

Bangor & Aroostook is taking bids on 500 box cars, 100 hopper cars and 50 rack cars.

Maine Central has ordered one gasoline-mechanical locomotive from Plymouth Locomotive Works.

Chile Exploration Co. has placed an order for 12 dump cars with Differential Steel Car Co.

Canadian National has ordered 10 cafe-sleeper cars and six dining cars from Canadian Car & Foundry Co., Ltd.

Milwaukee Road will ask permission to spend \$3,000,000 for new equipment. It is planned to use this sum to construct 55 passenger cars and 464 flat cars in the road's own shops, and to purchase four locomotives.

Philadelphia Rapid Transit Co. has awarded contract to St. Louis Car Co. for 20 trolley cars on a bid of \$334,967.

. . . SAN FRANCISCO . . .

... Naval air station award to require large quantity of piling.

SAN FRANCISCO, Feb. 15.—Large steel awards in the local market were lacking in the past week as executives of all California mill, jobbing, and warehouse firms convened at Del Monte, Cal., for the 14th annual Conference of the Iron, Steel and Allied Industries.

Even as members were discussing labor problems, workmen on the All-American Canal project were on strike demanding increased wages and the closed shop. Steel awards for the project were very light the first part of the year pending settlement of difficulties, but renewed buying a fortnight ago was evidently based on a false hope that the trouble would be ironed out.

Contract for the construction of bulkheads, piers, and jetties at the Alameda, Cal., naval air station was awarded to the San Francisco Bridge Co., San Francisco, on a bid of \$940,000. The successful bidder's specifications were not immediately available, but it is estimated that from 2600 to 5000 tons of steel sheet piling will be required for the work.

Activity in Pacific Coast mills has shown a slight pickup in the last fortnight, and sentiment is noticeably improving as jobbers' stocks dwindle.

. . . ST. LOUIS . . .

... Sheet price reduction acts as deterrent on buying.

ST. LOUIS, Feb. 15.—The reduction of \$2 a ton in the price of cold-rolled sheets and the elimination of the charge of \$2 a ton for oiling is reported to have had a deterrent effect on buying of all finished steel, as some factors saw in this a possibility of reductions in other items.

Business with the structural steel fabricators in the district is at a low point. It is estimated that the plants are being operated only at about 25 per cent of capacity. The Missouri Bridge & Iron Co. is low bidder at \$99 a ton, delivered, for 100 tons of fabricated shapes for signal system platforms for the municipal bridge here. Pending are 300 tons of reinforcing bars for a State office building at Jefferson City, Mo., and 100

tons for a building for the State School for the Deaf at Fulton, Mo., McCarthy Brothers, St. Louis being the low bidder on the latter project.

The Philadelphia Rapid Transit Co. has ordered 20 trolley cars from the St. Louis Car Co. to cost \$334,967.

Buying of pig iron continues on a hand-to-mouth basis, a carload or so to fill in. While there is little forward buying, specifications against contracts are more satisfactory, and shipments for the first two weeks in February, are about equal to the same period in January.

Ingot operations in the district have been stepped up to 28.7 per cent of capacity.

. . . GREAT BRITAIN . . .

... Further easing noted in European steel markets.

LONDON, Feb. 15 (By Cable).—There is no new business in Cleveland foundry pig iron as foreign supplies under old contracts are still arriving. Furnace owners are now accumulating small stocks as consumers are declining to take up deliveries. Hematite producers, holding orders for several months, are better placed. Moderate parcels are available for export but buyers are shy.

Semi-finished makers are busy and Tees supplies have been augmented by the arrival of 10,000 tons during January from the Continent. Heavy steel makers, especially on plates, sections and joists, are fully occupied up to the second half despite cancellations on Far Eastern account.

There is a poor demand for tubes, which compelled Stewarts Lloyds to close one steel furnace.

Russia has placed orders here at steel works plant involving 5000 tons of castings and forgings.

The Continental iron and steel market is dull and the immediate outlook is unfavorable. The output is in excess of demand and makers' order books are in need of replenishment. There are good shipments of semi-finished to the United Kingdom, but new orders are scarce and a reduction of output is expected.

The tin plate market is still quiet and unfilled orders amount to 3,500,000 base boxes. Black sheets are quiet. Galvanized sheets are idle except for the negotiations which are proceeding in connection with a special Australian order for 30,000 tons for delivery by July 31.

. . . PIPE LINES . . .

Southern Natural Gas Co., Birmingham, is arranging for purchase of several welded steel pipe lines in Mississippi, heretofore owned by Mississippi Power & Light Co., Jackson, Miss., for a consideration of \$97,378, and plans extensions in lines for connection with system for natural gas transmission.

Hidalgo Gas Co., McAllen, Tex., has authorized a new 8-in. welded steel pipe line from gas field at Santa Domingo, Tex., to connection with main trunk line at Samfordyce, Tex., about eight miles, for natural gas transmission. Line will be built by company forces.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 24 for 6600 ft. of 1 and 1½-in. galvanized steel pipe (Circular 677).

Citizens' Gas & Coke Utility, 47 South Penn Avenue, Indianapolis, has arranged fund of about \$200,000 for expansion and improvements, part of appropriation to be used for extensions and replacements in pipe lines for gas transmission in different parts of city.

Texas Co., Twentieth Street and First Avenue, Huntington, W. Va., plans installation of four 6-in. steel pipe lines for oil and gasoline transmission in connection with new local bulk terminal on waterfront. Executive offices of company are at 135 East Forty-second Street, New York.

Cleveland within the next two months will be in the market for 11,000 ft. of 36-in. steel pipe for a further extension of its new line from Parma Reservoir.

Wherry Brothers, Washington, Pa., plan extensions in welded steel pipe lines for natural gas transmission in connection with development of natural gas field near Bentleyville, Pa.

Purchasing and Contracting Officer, New York Port of Embarkation, Brooklyn, closes bids Feb. 18 for galvanized welded steel pipe (Proposal 626-9).

Springfield, Ill., will ask bids soon for about 7000 ft. of 24-in. steel pipe for main water line, also quotations on same size cast iron pressure pipe.

Waukon, Iowa, plans pipe lines for municipal gas distribution system. Surveys and estimates of cost will be made by Gas Engineering Corp., Des Moines, Iowa.

Seattle Board of Public Works closes bids Feb. 17 for constructing the Magnolia-Queen Anne-Volunteer Park pipe line which includes 36 and 24-in. steel pipe and 12 to 20-in. cast iron pipe water mains and a pumping station on Queen Anne Hill. Cost about \$300,000.

Continental Can Co. Inventory Increased

CONTINENTAL CAN CO., INC., reports that as of Dec. 31, 1937, its inventory value amounted to \$39,445,448 compared with \$25,080,857 at the end of 1936. "Some of this increase of \$14,364,591 resulted from the manufacture and stocking of raw materials to meet an anticipated demand estimated to be above normal requirements," the company said in announcing its 1937 net earnings were \$8,721,020 compared with \$9,038,787 in 1936.

NON-FERROUS

Non-ferrous sales continue very light.

Domestic copper stocks increase 39,225 tons.

Lead quotations reduced to 4.50c., New York.

NEW YORK, Feb. 15.—All domestic non-ferrous markets were very quiet during the past week and sales were at the same low levels of the last three weeks. The copper market has been particularly dull in anticipation of the January statistics which were released this morning and which show an increase in domestic refined stocks of

39,225 tons to 299,133 tons, the highest stock position since the summer months of 1935. Deliveries in January amounted to 30,705 tons, as compared with 22,788 tons in December. Production, contrary to expectations, also increased, the January total of 70,487 tons being 10,024 tons above the December figure. In accounting for this increase, the trade points out

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 9	Feb. 10	Feb. 11	Feb. 12	Feb. 14	Feb. 15
Electrolytic copper, Conn.*	10.00	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.125	10.125	10.125	10.125	10.125	10.125
Straits tin, spot New York	40.875	40.625	40.50	40.625	41.25	
Zinc, East St. Louis	4.75	4.75	4.75	4.75	4.75	4.75
Zinc, New York	5.10	5.10	5.10	5.10	5.10	5.10
Lead, St. Louis	4.60	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.75	4.50	4.50	4.50	4.50	4.50

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 15.75c. a lb., prompt, f.o.b., New York.
Antimony, American, 13.75c. per lb., prompt shipment, New York.
Quicksilver, \$77.00 to \$79.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5, 10.25c. a lb., less carload, delivered in Middle West
1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	41.75c. to 42.75c.
Tin, bar	43.75c. to 44.75c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	18.125c.
*High brass sheets	16.625c.
*Seamless brass tubes	19.375c.
*Seamless copper tubes	18.625c.
*Brass rods	12.625c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	11.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.625c. to 7.625c.
Lead, sheets, cut	8.00c.
Antimony, Asiatic	16.00c. to 17.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, 1/2 and 1/4	29.00c. to 31.00c.
Babbitt metal, commercial grade	20.00c. to 50.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	44.75c.
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that blister stocks in January decreased 11,680 tons, indicating that the increased production was attributable to the conversion of blister into refined metal. Domestic sales for the month have been averaging about 550 tons per day. The domestic price position remains unchanged at 10c. per lb., Connecticut Valley, for electrolytic metal, while this morning's export price of 9.65c. per lb., c.i.f., usual European base ports, is 5 points below the price of a week ago.

Lead

Demands for immediate delivery continue to account for the bulk of current sales, with the result that February is about completely covered while 70 per cent of March's needs is yet to be bought. Despite the second reduction inside of a week, bringing quotations down to 4.50c. per lb., New York, the lowest price since 1935, consumers maintain the practice of covering only their immediate requirements.

Zinc

Prime western sales for the past week were 1144 tons, as compared with 1187 tons in the preceding week, and deliveries amounted to 2757 tons, a decline of 899 tons from the previous week. Undelivered stocks now stand at 38,181 tons. Sales of prime western metal in January for delivery in that month were 2899 tons at an average weighted selling price of 5.002c. per lb., East St. Louis. January sales for future delivery were 6393 tons at an average price of 5c. per lb., East St. Louis. Domestic quotations were steady and unchanged all week at 5.10c. per lb., New York, while spot spelter on the London exchange was quoted at 3.06c. per lb. this morning, seven points below the price of one week ago.

Tin

Pending the meeting of the International Control Committee on Friday, both buyers and sellers have shown little interest in the market. Buying has been very light with probably the largest sale of the week being 90 tons for the Navy Department. Prices have moved in a very limited range all week and today's quotation on Straits metal of 41.25c. per lb., New York, is 75 points above the price of a week ago. The average price for the week ended today is 40.75c., up 15 points from the previous figure. Straits metal in London this morning was quoted at £181 5s. for both prompt and futures, a gain of £3 10s. over the price of a week ago.

IRON AND STEEL SCRAP

... No. 1 Steel declines 25c a ton at Pittsburgh as some dealers liquidate stocks.

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... Composite off 9c. to \$13.83.

FEB. 15.—With practically no mill buying throughout the country, markets are largely nominal. Prices remain unchanged at Chicago and Philadelphia, but with No. 1 steel marked down 25c. at Pittsburgh, THE IRON AGE composite price has declined for the second week. The average price of \$13.83 is 17c. under the figure prevailing all during January, but is still 91c. above the low point of \$12.92 last recorded on Nov. 30. Prices at Pittsburgh are easier since some dealers are willing to liquidate stocks accumulated during the past several weeks. St. Louis buying prices are down 25c. to 50c. on most items, largely reflecting a recent mill purchase of 2000 tons of No. 2 steel at \$11.50, representing a decline of 25c.

For some weeks, the export market has been losing its kick in the continued absence of new orders. Now, it appears that the European cartel will not enter the market again for several months to come, and reports of large Japanese purchases are merely rumors without basis in fact.

Pittsburgh

The market tone is slightly easier this week owing to a few dealers being willing to liquidate some stocks of heavy melting steel accumulated during the past several weeks. Most brokers can pick up No. 1 heavy melting at \$13.75 a ton, although occasional dealer transactions have occurred recently at \$14. Small sales into consumption involving No. 1 steel have been made recently at \$14 a ton. All factors considered, the average price of No. 1 heavy melting is approximately \$14 a ton, making a range of \$13.75 to \$14.25. This is a decline of 25c. a ton from last week's quotation. Lack of activity, however, makes present prices somewhat nominal, but no drastic decline is possible.

Chicago

Inactivity continues to dominate this market, prices being unchanged and nominal. In view of the low operations in this district and the large amounts of scrap in yards and on order, the lack of mill interest at this time is not surprising. Some scrap brokers are predicting marked upward moves in the second quarter and little, if any, further reduction this quarter in the current price of \$12.50 to \$13 for No. 1 heavy melting steel.

Cleveland

With very little material moving either to mills or dealers yards here, scrap continues to mark time, all quotations being nominal. As mills are gradually working off a little of their inventory scrap, there is some hope among dealers that possibly conditions next month might show improvement, but at the present time there is very little of a concrete nature to base such hopes upon. One mill continues to receive small regulated shipments of blast furnace grades and a few dealers occasionally are picking up material for their yards. The quotation on No. 1 heavy melting at Cleveland continues at \$12 to \$12.50 per ton.

Buffalo

The largest area consumer still is receiving scrap and relieving the pressure on dealers yards, but in the meantime is accumulating one of the largest piles it has ever had at this point. Receipts of 2500 to 3000 tons a week recently have brought this accumulation to approximately 250,000 tons. Reports are current that this mill soon may retire from the market. The buying price for No. 1 heavy melting steel continues to be \$13, though this price is extended only to certain dealers who have in the past worked closely with the mill. To some out-of-town dealers, the mill has declined to pay more than \$12.50.

Cincinnati

The old materials market is without news. Dealers make small transactions, but worthwhile activity is totally absent from the market. Yards are in good supply, but mill interest in purchases is totally absent.

St. Louis

A district melter bought 2000 tons of No. 2 heavy melting steel at \$11.50, which caused dealers to reduce their buying prices accordingly, freer offerings from the country also helped to effect lower prices, and dealers buying prices are from 25c. to \$1 a ton lower on some items. The Missouri-Pacific sold 55 carloads of various items, but most of it went to Kansas City consumers. The Louisville & Nashville sold 1400 tons of rerolling rails, 560 tons of melting steel and 300 tons of No. 2 rails, which will be sent to Gulf ports for export.

Philadelphia

Sentiment here has taken on a little better tone, although there is certainly still nothing in the domestic picture to encourage holders of scrap accumulations. The export market, on the other hand, continues to be moderately active, and

has served for some time to remove all distress material from this territory. No. 1 and No. 2 steels can easily find a home at Port Richmond at \$15 and \$14 respectively, and recently there have been occasions where higher prices have been paid. One boat is loading now and several more are expected in before the month's end, and broker sentiment in general is to the effect that export will serve to support this district until the time comes when domestic mills are inevitably forced in to build up their stock positions.

Detroit

Because speculative sentiment has decreased, there is apparent weakness in the Detroit area market that is reflected in average quotations. This attitude is fostered largely because docks already have a heavy load of scrap laid down on speculation in the last two months, and most dealers have tied up as much money as they feel able to, particularly in the lighter grades of scrap. A steadier tone was lent quotations when a small producer outside this area bought several thousand tons of No. 2 steel at a reported price from \$8.25 to \$8.50 a ton. A Fisher Body list closed Tuesday afternoon.

New York

With domestic buying almost completely absent, except on heavy breakable cast, and no new export orders to amount to anything, trading is very dull. Although there is yet to be shipped a considerable tonnage on the last European cartel order, material is coming out very slowly and has to be picked up in small lots from a large number of sources. Export buying prices tend to be soft. It is understood that before returning to England last Friday, the director of scrap purchases for the European steel cartel let it be known that the cartel would not be in the market for additional scrap materials for some months to come. Meanwhile, reports circulating hereabouts to the effect that the Japanese have purchased 100,000 tons of scrap appear to be grossly exaggerated. As mentioned last week, Japanese buying is confined to small tonnage lots, a recent purchase of 500 tons of rails being the largest of several small orders placed in recent weeks.

Boston

Exporting is steadily growing less active, and there is no indication at the moment that Europe will place fresh orders in this country. No. 1 steel is holding at \$14 a ton on dock here, and No. 2 at \$13, but there are signs of lower prices in the making. Practically nothing but a few steel turnings and bundled skeleton are moving to the Pittsburgh district. The Phillipsdale, R. I., mill is in the market for steel, but with specifications so rigid it is obtaining little. Chemical borings are moving steadily but in small lots to gas clarifying plants, and scattered sales of No. 1 textile and machinery cast are going to foundries at \$15 to \$15.50 a ton delivered.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton to delivered to consumer:	
No. 1 hvy. mltng. steel.	\$13.75 to \$14.25
Railroad hvy. mltng.	15.50 to 16.00
No. 2 hvy. mltng. steel	12.75 to 13.25
Scrap rails	15.00 to 15.50
Rails 3 ft. and under	18.00 to 18.50
Comp. sheet steel	13.75 to 14.25
Hand bundled sheets	12.75 to 13.25
Hvy. steel axle turn.	12.25 to 12.75
Machine shop turn	8.00 to 8.50
Short shov. turn	8.00 to 8.50
Mixed bor. & turn	6.75 to 7.25
Cast iron borings	6.75 to 7.25
Cast iron carwheels	15.00 to 15.50
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	16.00 to 16.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet crops	18.00 to 18.50
Low phos. sh. bar	17.50 to 18.00
Low phos. punchings	17.00 to 17.50
Low phos. plate, hvy.	17.00 to 18.00
Low phos. plate clips	15.00 to 15.50
Steel car axles	17.50 to 18.00

PHILADELPHIA

Per gross ton to delivered to consumer:	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel	13.50 to 14.00
Hydraulic bund. new	14.50 to 15.00
Hydraulic bund. old	10.50 to 11.00
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50 to 16.00
Hvy. breakable cast	14.50 to 15.00
No. 1 cast	15.50 to 16.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.00 to 15.50
Machine shop turn	6.50 to 7.00
No. 1 blast furnace	6.00 to 6.50
Cast borings	6.00 to 6.50
Heavy axle turnings	10.50 to 11.00
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	19.00 to 19.50
Shafting	19.00 to 19.50
No. 1 RR. wrought	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	12.50 to 13.00

CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel	\$12.50 to \$13.00
Auto. hvy. mltng. steel	
alloy free	11.00 to 11.50
No. 2 auto. steel	10.50 to 11.00
Shoveling steel	12.50 to 13.00
Hydraul. comp. sheets	11.50 to 12.00
Drop forge flashings	10.25 to 10.75
No. 1 busheling	11.25 to 11.75
No. 2 busheling, old	5.75 to 6.25
Rolled carwheels	15.00 to 15.50
Railroad tires, cut	16.25 to 17.25
Railroad leaf springs	16.00 to 16.50
Steel coup. & knuckles	15.00 to 15.50
Axle turnings	12.00 to 12.50
Coll springs	17.50 to 18.00
Axle turn. (elec.)	12.50 to 13.00
Low phos. punchings	16.00 to 16.50
Low phos. plates, 12 in.	
and under	15.50 to 16.00
Cast iron borings	6.00 to 6.50
Short shov. turnings	8.00 to 8.50
Machine shop turn	5.50 to 6.00
Rerolling rails	15.25 to 15.75
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	14.75 to 15.25
Railroad malleable	14.25 to 14.75
Agric. malleable	12.25 to 12.75

Per Net Ton	
Iron car axles	\$18.50 to \$19.00
Steel car axles	17.00 to 17.50
No. 1 RR. wrought	10.00 to 10.50
No. 2 RR. wrought	10.75 to 11.25
Locomotive tires	16.25 to 16.75
Pipes and flues	9.25 to 9.75
No. 1 machinery cast	12.00 to 12.50
Clean auto. cast	11.75 to 12.25
No. 1 railroad cast	11.25 to 11.75
No. 1 agric. cast	11.00 to 11.50
Stove plate	8.75 to 9.25
Grate bars	9.00 to 9.50
Brake shoes	8.50 to 9.00

YOUNGSTOWN

Per gross ton to delivered to consumer:	
No. 1 hvy. mltng. steel	\$13.00 to \$13.50
Hydraulic bundles	12.50 to 13.00
Machine shop turn	9.50 to 10.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$12.00 to \$12.50
No. 2 hvy. mltng. steel	11.00 to 11.50
Comp. sheet steel	11.50 to 12.00
Light bund. stampings	8.50 to 9.00
Drop forge flashings	11.00 to 11.50
Machine shop turn	7.50 to 8.00
Short shov. turn	8.50 to 9.00
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet and bloom crops	18.00 to 18.50
Cast iron borings	8.00 to 8.50
Mixed bor. & turn	8.00 to 8.50
No. 2 busheling	8.00 to 8.50
No. 1 cast	16.00 to 16.50
Railroad grate bars	8.00 to 8.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	17.50 to 18.00
Rails for rolling	16.00 to 16.50
Railroad malleable	16.00 to 16.50
Cast iron carwheels	15.00 to 15.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel	\$12.50 to \$13.00
No. 2 hvy. mltng. steel	10.50 to 11.00
Scrap rails	12.50 to 13.00
New hvy. b'dled sheets	11.00 to 11.50
Old hydraul. bundles	10.00 to 11.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. axle turnings	11.00 to 11.50
Machine shop turn	
Knuckles & couplers	16.00 to 16.50
Coll & leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	17.00 to 17.50
Shov. turnings	8.00 to 8.50
Mixed bor. & turn	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Steel car axles	16.00 to 16.50
No. 1 machinery cast	15.00 to 15.50
Stove plate	13.50 to 14.00
Steel rails under 3 ft.	17.50 to 18.00
Steel rails under 2 ft.	14.50 to 15.00
Cast iron carwheels	14.50 to 15.00
Chemical borings	10.00 to 10.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:	
Selected hvy. melting	\$12.50 to \$13.00
No. 1 hvy. melting	12.50 to 13.00
No. 2 hvy. melting	11.00 to 11.50
No. 1 locomotive tires	16.00 to 16.50
Misc. stand. sec. rails	13.50 to 14.00
Railroad springs	15.50 to 16.00
Bundled sheets	10.00 to 10.50
No. 1 busheling	7.00 to 7.50
Cast bor. & turn	6.00 to 6.50
Rails for rolling	14.00 to 14.50
Machine shop turn	6.00 to 6.50
Heavy turnings	8.50 to 9.00
Steel car axles	19.50 to 20.00
Iron car axles	21.50 to 22.00
No. 1 RR. wrought	8.00 to 8.50
No. 2 RR. wrought	12.50 to 13.00
Steel rails under 3 ft.	14.50 to 15.00
Steel angle bars	13.50 to 14.00
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	12.00 to 12.50
Railroad malleable	13.00 to 13.50
No. 1 railroad cast	11.50 to 12.00
Stove plate	9.00 to 9.50
Agric. malleable	10.00 to 10.50
Grate bars	9.50 to 10.00
Brake shoes	9.50 to 10.00

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$9.50 to \$10.00
No. 2 hvy. mltng. steel	7.50 to 8.00
Scrap rails	14.00 to 14.50
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00 to 10.50
No. 1 cast	14.00 to 14.50
Rails (scrap)	14.00 to 14.50
No. 1 hvy. mltng. steel	\$14.50 to \$15.00
No. 2 hvy. mltng. steel	13.50 to 14.00
Stove plate	11.00 to 11.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$11.50 to \$12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00 to 10.50
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 14.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$9.50 to \$10.00
No. 2 hvy. mltng. steel	8.00 to 8.50
Borings and turnings	6.25 to 6.75
Long turnings	5.75 to 6.25
Short shov. turnings	6.75 to 7.25
No. 1 machinery cast	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast	10.25 to 10.75
Hydraul. comp. sheets	10.75 to 11.25
Stove plate	7.50 to 8.00
New factory bushel	9.50 to 10.00
No. 2 busheling (black fender stock)	5.00 to 5.50

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel	\$11.00 to \$11.50
No. 2 hvy. mltng. steel	10.50 to 11.00
Hvy. breakable cast	10.50 to 11.00
Old auto. cast	12.00 to 12.50
Stove plate	9.50 to 10.00
Cast borings	8.50 to 9.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings	5.00 to 5.50
Cast borings*	5.00 to 5.50
No. 1 blast furnace	5.00 to 5.50
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	7.50 to 8.00
Light iron	4.00 to 4.50

*\$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$13.30 to \$13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	9.75
Machine shop turn	2.60
Mixed bor. & turn	2.60
Bun. skeleton long	6.50 to 6.75
Shafting	17.00 to 17.50
Cast bor. chemical	6.00 to 6.50

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
Rerolling \$37.00
Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Bessemer \$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared 2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
F.o.b. Pittsburgh or Cleveland. \$47.00
F.o.b. Chicago, Youngstown or

Anderson, Ind. 48.00
F.o.b. Worcester, Mass. 49.00

F.o.b. Birmingham 50.00

F.o.b. San Francisco 56.00

F.o.b. Galveston 53.00

Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.

F.o.b. Pittsburgh 2.45c.

F.o.b. Chicago or Gary 2.50c.

F.o.b. Duluth 2.60c.

Del'd Detroit 2.60c.

F.o.b. Cleveland 2.50c.

F.o.b. Buffalo 2.55c.

Del'd Philadelphia 2.75c.

Del'd New York 2.79c.

F.o.b. Birmingham 2.60c.

F.o.b. cars dock Gulf ports 2.35c.

F.o.b. cars Pacific ports 3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.30c.

F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.35c.

F.o.b. Buffalo 2.40c.

F.o.b. Birmingham 2.45c.

F.o.b. cars dock Gulf ports 2.70c.

F.o.b. cars dock Pacific ports 2.85c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.45c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.50c.

Del'd Detroit 2.60c.

F.o.b. cars dock Gulf ports 2.85c.

F.o.b. cars dock Pacific ports 2.95c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.30c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.35c.

F.o.b. cars dock Gulf ports 2.70c.

F.o.b. cars dock Pacific ports 2.90c.

Iron

F.o.b. Chicago 2.40c.

F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh 2.90c.

F.o.b. Cleveland, Chicago and Gary 2.95c.

F.o.b. Buffalo 3.00c.

F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 19,000 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago or Gary 2.30c.

Del'd Cleveland 2.445c.

F.o.b. Coatesville or Spa Pt. 2.35c.

Del'd Philadelphia 2.44c.

Del'd New York 2.54c.

F.o.b. Birmingham 2.40c.
F.o.b. cars dock Gulf ports 2.65c.
F.o.b. cars dock Pacific ports 2.80c.
Wrought iron plates, f.o.b. Pittsburgh 3.30c.

Floor Plates

F.o.b. Pittsburgh 3.50c.

F.o.b. Chicago 3.55c.

F.o.b. Coatesville 3.60c.

F.o.b. cars dock Gulf ports 3.90c.

F.o.b. cars dock Pacific ports 4.05c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago 2.30c.

Del'd Cleveland 2.445c.

F.o.b. Buffalo or Bethlehem 2.35c.

Del'd Philadelphia 2.465c.

Del'd New York 2.5125c.

F.o.b. Birmingham (standard) 2.40c.

F.o.b. cars dock Gulf ports 2.60c.

F.o.b. cars dock Pacific ports 2.80c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh 2.60c.

F.o.b. Chicago or Buffalo 2.70c.

F.o.b. cars dock Gulf or Pacific Coast ports 3.05c.

F.o.b. cars dock Pacific ports 3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$42.50

Angle bars, per 100 lb. 2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton \$43.00

Light rails (from rail steel) per gross ton 42.00

Base per Lb.

Spikes 3.15c.

Tie plates, steel 2.30c.

Tie plates, Pacific Coast ports. 2.40c.

Track bolts, to steam railroads 4.35c.

Track bolts, to jobbers, all sizes (per 100 counts) 65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on the plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh 2.40c.

No. 10, f.o.b. Gary 2.50c.

No. 10, del'd Detroit 2.60c.

No. 10, del'd Philadelphia 2.70c.

No. 10, f.o.b. Granite City 2.60c.

No. 10, f.o.b. Birmingham 2.55c.

No. 10, f.o.b. cars dock Pacific ports 2.95c.

No. 10, wrought iron, P'gh 4.25c.

Hot Rolled Annealed

No. 24, f.o.b. Pittsburgh 3.15c.

No. 24, f.o.b. Gary 3.25c.

No. 24, del'd Detroit 3.35c.

No. 24, del'd Philadelphia 3.45c.

No. 24, f.o.b. Granite City 3.35c.

No. 24, f.o.b. Birmingham 3.30c.

No. 24, f.o.b. cars dock Pacific ports 3.80c.

No. 24, wrought iron, Pittsburgh 5.15c.

Heavy Cold Rolled

No. 10 gage, f.o.b. Pittsburgh 3.00c.

No. 10 gage, f.o.b. Gary 3.10c.

No. 10 gage, f.o.b. Detroit 3.20c.

No. 10 gage, del'd Philadelphia 3.30c.

No. 10, f.o.b. Granite City 3.20c.

No. 10 gage, f.o.b. Birmingham 3.15c.

No. 10 gage, f.o.b. cars, dock Pacific ports 3.525c.

Light Cold Rolled

No. 20 gage, f.o.b. Pittsburgh 2.45c.

No. 20 gage, f.o.b. Gary 3.55c.

No. 20 gage, del'd Detroit 3.65c.

No. 20 gage, del'd Philadelphia 3.75c.

No. 20 f.o.b. Granite City 3.65c.

No. 20 gage, f.o.b. Birmingham 3.60c.

No. 20 gage, f.o.b. cars, dock Pacific ports 3.925c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh 3.80c.

No. 24, f.o.b. Gary 3.90c.

No. 24, del'd Philadelphia 4.10c.

No. 24, f.o.b. Granite City 4.00c.
No. 24, f.o.b. Birmingham 3.95c.
No. 24, f.o.b. cars, dock, Pacific ports 4.40c.
No. 24, wrought iron, Pittsburgh 6.10c.

Electrical Sheets

(f.o.b. Pittsburgh)

Base per Lb.

Field grade 3.35c.

Armature 3.70c.

Electrical 4.20c.

Special Motor 5.10c.

Special Dynamo 5.80c.

Transformer 6.30c.

Transformer Special 7.30c.

Transformer Extra Special 7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Slitton Strip in coils—Sheet price plus slitton sheet extra width extras plus 25¢ per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating

f.o.b. Pittsburgh 4.10c.

F.o.b. Gary 4.20c.

F.o.b. cars dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.50c.

No. 20, f.o.b. Gary 3.60c.

No. 20, f.o.b. Granite City 3.70c.

No. 20, f.o.b. cars dock Pacific ports 4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.

..... 3.30c.

No. 28, Gary 3.40c.

No. 28, f.o.b. Granite City 3.50c.

No. 28, cars dock Pacific ports, boxed 4.175c.

Tin Plate

Base per Box

Standard cokes, f.o.b. Pittsburgh district mill \$5.35

Standard cokes, f.o.b. Gary 5.45

Standard coke, f.o.b. Granite City 5.55

Special Coated Manufacturing Terne

Base per Box

F.o.b. Pittsburgh 4.65c.

F.o.b. Gary 4.75c.

F.o.b. Granite City 4.85c.

Roofing Terne Plate

(f.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C. \$12.00

15-lb. coating I.C. 14.00

20-lb. coating I.C. 15.00

25-lb. coating I.C. 16.00

30-lb. coating I.C. 17.25

40-lb. coating I.C. 19.50

Hot-rolled Hoops, Bands, Strip and Flats under 1/4 in.

Base per Lb.

All widths up to 24 in., Pittsburgh 2.40c.

All widths up to 24 in., Chicago 2.50c.

All widths up to 24 in., del'd Detroit 2.60c.

All widths up to 24 in., Granite City 2.60c.

All widths up to 24 in., Birmingham 2.55c.

Cooperage stock, Pittsburgh 2.50c.

Cooperage stock, Chicago 2.60c.

Cold Roll'd Strip*

Base per Lb.

F.o.b. Pittsburgh 3.20c.

F.o.b. Cleveland 3.20c.

F.o.b. Chicago 3.48c.

F.o.b. Worcester 3.40c.

*Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh

and

Cleveland Worcester

Carbon 0.25-0.50% 3.20c. 3.40c.

Carbon .51-.75 4.45c. 4.65c.

Carbon .76-1.00 6.30c. 6.50c.

Carbon Over 1.00 8.50c. 8.70c.

Fender Stock</

WIRE PRODUCTS
 (Carload lots, f.o.b. Pittsburgh and Cleveland)
 To Manufacturing Trade

Per Lb.
 Bright wire 2.90c.
 Galvanized wire 2.95c.
 Spring wire 3.50c.
 Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade Base per Keg

Standard wire nails \$2.75
 Smooth coated nails 2.75
 Cut nails, carloads 3.60

Base per 100 Lb.

Annealed fence wire \$3.15
 Galvanized fence wire 3.55
 Polished staples 3.45
 Galvanized staples 3.70
 Barbed wire, galvanized 3.40
 Twisted barbless wire 3.40
 Woven wire fence, base column 75
 Single loop half ties, base col. 63
 Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel	Wrought Iron		
In.	Black Galv.	In.	Black Galv.
1/8	52	31	1/4 & 3/8 +13 +35
1/4 to 3/8	55	38 1/2	1/2
1/2	59 1/2	49	20
3/4	62 1/2	53	26
1 to 3	64 1/2	55 1/2	1 & 1/4
			30
			14
			34
			16 1/2
			33 1/2
			16

Lap Weld

2	57	47 1/2	2	26 1/2	10
2 1/2 & 3	60	50 1/2	2 1/2 to 3 1/2	27 1/2	12 1/2
3 1/2 to 6	62	52 1/2	4	29 1/2	16
7 & 8	61	50 1/2	4 1/2 to 8	28 1/2	15
9 & 10	60 1/2	50	9 to 12	24 1/2	10
11 & 12	59 1/2	49			

Butt Weld, extra strong, plain ends

1/8	50 1/2	36 1/2	1/4 & 3/8	+14 +48
1/4 to 3/8	52 1/2	40 1/2	1/2	21 4
1/2	57 1/2	48 1/2	3/4	27 10
3/4	61 1/2	52 1/2	1 to 2	2.34 17 1/2
1 to 3	63	55		

Lap Weld, extra strong, plain ends

2	55	46 1/2	2	29 1/2	13 1/2
2 1/2 & 3	59	50 1/2	2 1/2 to 4	35	20 1/2
3 1/2 to 6	62	54	4 1/2 to 6	33 1/2	19
7 & 8	61 1/2	51	7 & 8	34 1/2	19 1/2
9 & 10	60 1/2	50	9 to 12	28	15 1/2
11 & 12	59 1/2	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold	Hot
	Drawn	Rolled
1 in. o.d.	13 B.W.G.	\$ 9.46
1 1/2 in. o.d.	13 B.W.G.	11.21
1 1/2 in. o.d.	13 B.W.G.	12.38
1 1/2 in. o.d.	13 B.W.G.	12.51
2 in. o.d.	13 B.W.G.	15.78
2 1/2 in. o.d.	13 B.W.G.	17.60
2 1/2 in. o.d.	12 B.W.G.	15.63
2 1/2 in. o.d.	12 B.W.G.	19.37
2 1/2 in. o.d.	12 B.W.G.	21.22
2 1/2 in. o.d.	12 B.W.G.	22.49
3 in. o.d.	12 B.W.G.	23.60
4 1/2 in. o.d.	10 B.W.G.	45.19
3 1/2 in. o.d.	11 B.W.G.	29.75
4 in. o.d.	10 B.W.G.	36.96
5 in. o.d.	9 B.W.G.	56.71
6 in. o.d.	7 B.W.G.	87.07
		77.35
Extra for less-carload quantities:		
40,000 lb. or ft. or over.....		Base
30,000 lb. or ft. to 39,999 lb. or ft.		10%
20,000 lb. or ft. to 29,999 lb. or ft.		20%
10,000 lb. or ft. to 9,999 lb. or ft.		30%
5,000 lb. or ft. to 4,999 lb. or ft.		45%
2,000 lb. or ft. to 4,999 lb. or ft.		65%

CAST IRON WATER PIPE

Per Net Ton	
6-in. and larger, del'd Chicago	\$55.00
6-in. and larger, del'd New York	53.00
6-in. and larger, Birmingham	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
or Los Angeles	59.00
F.o.b. dock, Seattle	59.00
Class "A" and gas pipe, \$3 extra	
4-in. pipe is \$3 a ton above 6-in.	

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46. Birmingham, and \$54 delivered Chicago and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller	65 and 5*
Larger and longer up to	
1 in.	60 and 10*
1 1/8 in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller	65
9/16 in. to 1 in. inclusive	60 and 5
1 1/4 in. and larger	60

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:

1/2 in. and smaller	60 and 10
9/16 in. to 1 in. inclusive	60 and 5
1 1/4 in. and larger	60

Stove bolts in packages, nuts attached

Stove bolts in packages, with nuts separate

Stove bolts in bulk

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland .. \$3.60

F.o.b. Chicago or Birmingham .. 3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh

F.o.b. Cleveland

F.o.b. Chicago and Birmingham

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more.)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller

Milled standard set screws, case hardened, 1 in. dia. and smaller

Milled headless set screws, cut thread 1/4 in. and smaller

Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller

Upset set screws, cup and oval points

Milled studs

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, \$60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base

Delivered, Detroit

3.15c.

S.A.E. Alloy

Series Differential

Numbers per 100 lb.

200 (1/2% Nickel)

2100 (1 1/2% Nickel)

2300 (3 1/2% Nickel)

1.55

2500 (5% nickel)

3100 Nickelchromium

3200 Nickel-chromium

3300 Nickel-chromium

3400 Nickel-chromium

4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)

4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)

4600 Nickel - molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)

5100 Chrome steel (0.60-0.90 Cr.)

5100 Chrome steel (0.80-1.10 Cr.)

6100 Chromium-vanadium bar

6100 Chromium-vanadium spring steel

Chromium-nickel-vanadium

Carbon-vanadium

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

ALLOY COLD-FINISHED BARS
 F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c. carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

No. 304 No. 302

Forging billets 21.25c. 20.40c.

Bars 25c. 24c.

Plates 29c. 27c.

Structural shapes.... 25c. 24c.

Sheets 36c. 34c.

Hot-rolled strip .. 23.50c. 21.50c.

Cold-rolled strip .. 30c. 28c.

Drawn wire 25c. 24c.

Straight Chrome

No. No. No. No.

410 430 442 446

Bars .. 18.50c. 19c. 22.50c. 27.50c.

Plates .. 21.50c. 22c. 25.50c. 30.50c.

Sheets .. 26.50c. 29c. 32.50c. 36.50c.

Hot strip 17c. 17.50c. 23c. 28c.

Cold stp. 22c. 22.50c. 28.50c. 36.50c.

TOOL STEEL

High speed

High-carbon-chrome

Oil-hardening

Special

Extra

Regular

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. West of Mississippi quotations are 3c. a lb. higher.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	<i>Base per Lb.</i>
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs \$3.65
	<i>Per Cent Off List</i>
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	55
Carriage bolts, 100 count	55
Nuts, all styles, 100 count	55
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	\$3.30
Wire, galv. soft, base per 100 lb.	\$3.70
Common wire nails, per keg	\$2.90
Cement coated nails, per keg	\$2.90

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes..	3.75c.
Soft steel bars, rounds.....	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	4.95
Rivets, boiler (keg lots)	5.05
	<i>Per Cent Off List</i>
Machine bolts and carriage bolts, 1/4 in. and smaller	60
Lag screws	55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, 1/4 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 29
Spring coppers	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

	<i>Base per Lb.</i>
Plates, 1/4 in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. char-coal	7.25 to 7.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.75c.
Galvanized sheets (No. 24*)	5.25c.
Long terne sheets (No. 24)	5.50 to 6.20c.
Armclo iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armclo iron, hot-rolled annealed (No. 24†)	6.65c.
Toncan iron, hot-rolled annealed (No. 24†)	6.65c.
Armclo iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb. Standard quality	5.20c.
Deep drawing	5.85c.
Stretcher leveled	5.85c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, 1/4 in. and heavier	5.60c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Tire steel, 1 x 1/2 in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	3.25c.

Reinfor. steel bars

2.50c.

Cold-finished steel bars

4.30c.

Hot-rolled strip, 6 in. wide and under

4.16c.

Cold-finished strip

3.60c.

Hot-rolled annealed sheets (No. 24)

4.66c.

Galvanized sheets (No. 24)

5.31c.

Hot-rolled sheets (No. 10)

3.91c.

Hot-rolled 3/16 in. 24 to 48 in. wide sheets

3.91c.

Floor plates, 3/16 in. and heavier

5.76c.

*Black ann'l'd wire, per 100 lb.

\$3.40

*No. 9 galv. wire, per 100 lb.

3.80

*Com. wire nails, base per keg

2.95

Per Cent Off List

Machine and carriage bolts, small

65 and 5

Large

60 and 10

Nuts, 100 count

1/2 in. and smaller

65 and 5

9/16 in. to 1 in.

60 and 10

† Outside delivery 10c. less.

* For 5000 lb. or less.

† Plus switching and carriage charges and quantity differentials up to 50c.

CINCINNATI

Base per Lb.

Plates and struc. shapes

2.95c.

Floor plates

5.55c.

Bars, rounds, flats and angles

4.05c.

Other shapes

4.20c.

Rail steel reinforce. bars

3.75

Hoops and bands, 3/16 in. and lighter

4.25c.

Cold-finished bars

4.50c.

Hot-rolled annealed sheets (No. 24) 3500 lb. or more

4.60c.

Galv. sheets (No. 24) 3500 lb. or more

\$5.25

Hot-rolled sheets (No. 10)

4.00c.

Small rivets

55 per cent off list

No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)

\$3.48

Com. wire nails, base per keg:

Any quantity less than carload. 3.20

Cement c't'd nails, base 100-lb. keg.

3.50

Chain. lin. per 100 lb.

8.35

Net per 100 Ft.

Seamless steel boiler tubes:

2-in.

\$21.80

4-in.

52.45

Lap-welded steel boiler tubes:

2-in.

20.73

4-in.

48.41

BUFFALO

Base per Lb.

Plates

3.92c.

Floor plates

5.52c.

Struc. shapes

3.80c.

Soft steel bars

3.90c.

Reinforcing bars

3.10c.

Cold-fin. flats and sq.

4.35c.

Rounds and hex.

4.35c.

Hot-rolled annealed sheets (No. 24)

4.80c.

Heavy hot-rolled sheets (3/16 in. to 48 in. wide)

3.97c.

Galv. sheet (No. 24)

5.45c.

Bands

4.22c.

Hoops

4.22c.

Heavy hot-rolled sheets

3.97c.

Com. wire nails, base per keg

\$3.26

Black wire, base per 100 lb. (2500-lb. lots or under)

4.55c.

(Over 2500 lb.)

4.45c.

BOSTON

Base per Lb.

Channels, angles

4.20c.

Tees and zees, under 3 in.

4.45c.

ri beams and shapes

4.07c.

Plates — Sheared, tank and univ. mill, 1/4 thick and heavier

4.08c.

Floor plates, diamond pattern

5.13c.

Bar and bar shapes (mild steel)

4.20c.

Bands 3/16 in. thick and No. 12 ga. incl.

4.40 to 5.40

Half rounds, half ovals, ovals and bevels

5.45c.

Tire steel

5.45c.

Cold-rolled strip steel

3.845c.

Cold-finished rounds, squares and hexagons

4.65c.

Cold-finished flats

4.65c.

Blue annealed sheets, No. 10 ga.

3.90c.

One pass cold-rolled sheets No. 24 ga.

4.50c.

Galvanized steel sheets, No. 24 ga.

5.05c.

DETROIT

Base per Lb.

Soft steel bars.....	3.49c.
Structural shapes.....	3.95c.
Plates.....	3.95c.
Floor plates.....	5.85c.
Hot-rolled annealed sheets (No. 24)*.....	4.69c.
Hot-rolled sheets (No. 10).....	3.94c.
Galvanized sheets (No. 24)*.....	5.40c.
Bands and hoops.....	4.19c.
Cold-finished bars.....	4.30c.
Cold-rolled strip.....	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series).....	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes.....	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles.....	3.96c.
Soft steel bars, squares and hexagons.....	4.11c.
Hot-rolled strip.....	4.21c.
Hot-rolled annealed sheets (No. 24).....	4.71c.
Galvanized sheets (No. 24).....	5.36c.
Cold-finished steel bars.....	4.41c.
Structural rivets (keg lots).....	5.16c.
Boiler rivets, cone head (keg lots).....	5.26c.
Track spikes (keg lots).....	4.61c.
Track bolts (keg lots).....	5.81c.
Black annealed wire (No. 6 to No. 9 incl.).....	4.05c.
Com. wire nails and cement coated nails 1 to 14 kegs.....	3.25c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller or shorter.....	65
Larger and longer up to 1 in., diam.....	60-5
1 1/2 in. and larger.....	60
Coach and lag screws.....	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.....	50
200 lb. and over: 1/2 in. and smaller.....	62 1/2
9/16 to 1 in.....	60
1 1/2 in. and over.....	50

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds.....	4.10c.
Structural shapes.....	4.00c.
Plates.....	4.00c.
Cold-finished bars.....	4.55c.
Hot-rolled annealed sheets, No. 24.....	4.85c.
Galvanized sheets, No. 24.....	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes.....	\$3.85 base
Structural shapes and plates.....	3.75 "
Hot rolled sheets No. 10 ga.....	3.80 "
Hot rolled sheets No. 24 ga.....	4.40 " 3500 lb. and over
Galvanized sheets No. 24 ga.....	5.05 " 3500 lb. or more
Strip.....	4.05 "
Reinforcing bars.....	3.85 "
Floor plates.....	5.96 "
Cold finished bars.....	4.91 "
Machine and carriage bolts.....	50 & 10 off list
Rivets (structural).....	\$4.60 base

On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes.....	4.00c.
Structural shapes.....	3.90c.
Reinforcing bars, 5 to 15 tons.....	3.16c.
Plates.....	3.90c.
Hot-rolled sheets, No. 10.....	3.95c.
Bands.....	4.20c.
Hoops.....	4.45c.
Special threading steel.....	4.15c.
Checkered floor plates 1/4 in. and heavier.....	5.50c.
Galvanized sheets, No. 24, 100 bds. or more.....	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more.....	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars.....	4.21c.
Iron bars.....	4.21c.
Reinforcing bars.....	4.21c.
Reinforcing shapes.....	4.11c.
Plates.....	4.11c.
Hot-rolled sheets No. 10.....	4.16c.
Hot-rolled annealed sheets, No. 24*.....	4.06c.
Galvanized sheets No. 24*.....	4.76c.
Steel bands.....	4.41c.
Cold-finished bars.....	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars.....	4.31c.
Shapes, bar size.....	4.31c.
Iron bars.....	4.31c.
Structural shapes.....	4.21c.
Plates.....	4.21c.
Hot-rolled sheets, No. 10.....	4.26c.
Hot-rolled annealed sheets, No. 24*.....	4.91c.
Galvanized sheets, No. 24.....	5.66c.
Steel bands.....	4.56c.
Cold-drawn rounds.....	4.80c.
Cold-drawn flats, squares, hexagons.....	6.80c.
Structural rivets.....	5.15c.
Bolts and nuts, per cent off list.....	55
Small rivets, per cent off list.....	55

NEW ORLEANS

Base per Lb.

Mild steel bars.....	4.20c.
Reinforcing bars.....	3.24c.
Structural shapes.....	4.10c.
Plates.....	4.10c.
Hot-rolled sheets, No. 10.....	4.35c.
Steel bands.....	4.75c.
Cold-finished steel bars.....	5.10c.
Structural rivets.....	4.85c.
Boiler rivets.....	4.85c.
Common wire nails, base per keg.....	\$3.55
Bolts and nuts, per cent off list.....	60

PACIFIC COAST

Base per Lb.

	San Fran-	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports ..	2.975c.	2.975c.	2.975c.
Hot - rolled an-nealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.25c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.45c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons..	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carolad	\$3.40	\$3.20	\$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey.....	56.00
Select, Ohio	49.00
Second quality, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey....	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton.....	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester...\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. ....49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.27
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.50
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro and Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.

Gray Forge

Valley or Pittsburgh furnace \$23.50

Charcoal

Lake Superior furnace \$27.00
Delivered Chicago 30.24

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	Per Gross Ton
Domestic, 80% (carload)	\$102.50

Spiegeleisen

Per Gross Ton Furnace	
Domestic 19 to 21%	\$33.00

Electric Ferrosilicon

Per Gross Ton Delivered;

Lump Size

50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	\$33.50
For each additional 0.50% silicon up to 17%, 50c. per ton is added.	

Manganese 2 to 3%, \$1 per ton additional. For each unit of manganese over 3%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% \$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del. carloads, nominally \$2.00

Ferrotungsten, lots of 500 lbs., nominally 2.05

Ferrotungsten, smaller lots, nominally 2.10

Ferrovanadium, contract, per lb. contained V, delivered \$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots, \$2.25†

Ferrocobaltitanium, 15 to 18%

Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton \$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton \$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton \$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville \$75.00

Ferromolybdenum, per lb., Mo. f.o.b. furnace 95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace 80c.

*Spot prices are \$5 per ton higher.

†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominally 17 to 18c.
Iron, basic or foundry, Swedish, aver. 65% iron	Nominally 16c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominally 16c.
Man. Caucasian, washed 52%	50c.
Man. African, Indian, 44-48%	45c.
Man. African, Indian, 49-51%	Nominal
Man. Brazilian, 46 to 48½%	Nominal

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00 to \$19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00

Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	5.25c.

Del'd Ch'go, No. 3 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.875c.

Del'd Cleve'd, No. 4 industrial	5.75c.
Del'd Cleve'd, No. 5 industrial	4.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt	\$4.00 to \$4.25
Furnace, f.o.b. Connells-ville, Prompt	5.00 to 6.25

Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50

Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95

Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50

Foundry, by-product, del'd Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50

Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

NIAGARA BRAND FERRO-ALLOYS

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

FERRO CHROMIUM
LOW CARBON

FERRO MANGANESE
SILICO MANGANESE

**PITTSBURGH
METALLURGICAL
COMPANY, Incorporated
NIAGARA FALLS, N.Y.**

SALES AGENTS

Oglebay Norton & Co., Hanna Bldg., Cleveland, Ohio
Pittsburgh Metallurgical Co., Oliver Bldg., Pittsburgh, Pa.

Phillips Isham, 30 Church St., New York, N. Y.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

...With backlogs reduced, builders are curtailing schedules.

Brisk inquiries in some centers traced to Army and Navy plans for aircraft, torpedoes and shells.

Foreign orders still a sustaining factor.

Arsenals and Firms with Navy Contracts Are Buying in the East

NEW YORK—Increasingly evident since the first of the year is the fact that almost without exception orders for machine tools reported in the Metropolitan district have come from concerns that are making equipment for various branches of the military service. Makers of control equipment for aircraft and ships for gun turrets, manufacturers of aircraft engines and accessory equipment are all busy and are buying machinery. As time goes on, many of these leading suppliers will become larger factors in the market. This situation has led one factory representative to predict that March sales will represent a substantial bulge in the present trend. The several Navy yards scattered along the East coast are buying and will buy more equipment. The rejuvenated torpedo plant at Alexandria, Va., will be aided by an appropriation of approximately \$1,500,000 for new machinery, and, before the project is completed, double this amount will be spent, but this buying will extend over several years. The torpedo station at Newport is due to enter the market also. Not to be outdone, a number of Army arsenals, Frankford and Watervliet to name two, are inquiring for proposals on equipment.

As a result of this business, sales are far from dragging along the bottom, although not every dealer is sharing in the business. Several sellers report an order volume close to that for the corresponding period in 1937; others that sales are meager. All agree, however, that inquiries are being sustained in volume. Proposal work is keeping most sellers busy and on the move. Several industrial machinery manufacturers, though still working only three days a week, report an increase in their own orders, leading some to believe that the bottom of the present recession has been reached and to hope for a better volume of machine tool sales from this group.

Production Curtailed As Orders Decline at Cincinnati

CINCINNATI—Machinery demand stepped another notch downward, the past week, despite steady market opti-

mism. Activity in lathes, millers and grinders, heretofore the chief sustaining influence of the market, felt a waning of concrete consumer interest the past week. Orders were less numerous, and quantities were limited to single standard units. On the other hand, inquiry continues to be brisk. Among requests are Government inquiries for possible armament equipment.

Production rates have been curtailed since some manufacturers see the end of backlogs and with shipping instructions less urgent a broader spread of operations is followed. One or two plants are still holding overtime schedules, but these are exceptional.

Buyers Continue To Mark Time At Cleveland

CLEVELAND—There has been very little to report here during the past week in the way of sizable orders. Buyers continue to mark time until the general industrial outlook becomes more settled. Inquiry is confined mostly to single tools. While some activity has been noted among Eastern buyers seeking second-hand machinery, mostly for export, the reaction has not been felt to any great extent in this district. Attention continues to be directed upon the probable plans for the automobile industry, which so far has not opened up to any great extent in buying.

Backlogs Being Depleted At Rockford Plants

CHICAGO—A slight increase in small tool orders during January, which has been maintained in the first 10 days of February, is lending encouragement to machine tool sellers in this area, although a definite upturn of any size is not anticipated before April or May at the earliest. Backlogs are well depleted in most Rockford plants, while in Cincinnati it is understood that May and June will see the completion of the majority of old orders. Opinion among builders differs considerably, however, in estimates of 1938 business. Some believe a turn will come before the middle of the year. Machine tool inquiries are scarce, with orders being received only occasionally. Some large tools are being bought, however, which augurs well as this type equipment in bad times is

usually withheld. Considerable foreign business is at hand in many plants, and in some, it is understood, present operations depend almost wholly upon orders from abroad. A large program may be seen soon from the Farmall works of International Harvester Co., where a small tractor is being contemplated, and the Milwaukee plant of the same company is also known to be considering some tool buying, although the latter plan has not yet been submitted to the home office.

Ford Inquiring for Machinery for Tractor Production

DETROIT—Most active spots in the Detroit machine tool market are Ford Motor Co. and the General Motors Truck plant. At the Rouge plant plans for the new tractor announced recently by Henry Ford are rapidly taking shape, and inquiries for manufacturing equipment are being formulated and passed along to dealers. Indications are that the tractor will use one of the V-8 engines, probably the 85-hp. model, and will be manufactured and assembled in what is known as the "B" building, where room will be available when the huge consolidated tool and die shop is opened. Machine buying to equip the tool and die unit is also in the spotlight. Chrysler activity is still latent, although it is predicted that a \$150,000 order will be placed with one firm by the end of this month. Foreign interests are said to have purchased 100 used lathes in the Detroit market in the last week or ten days.

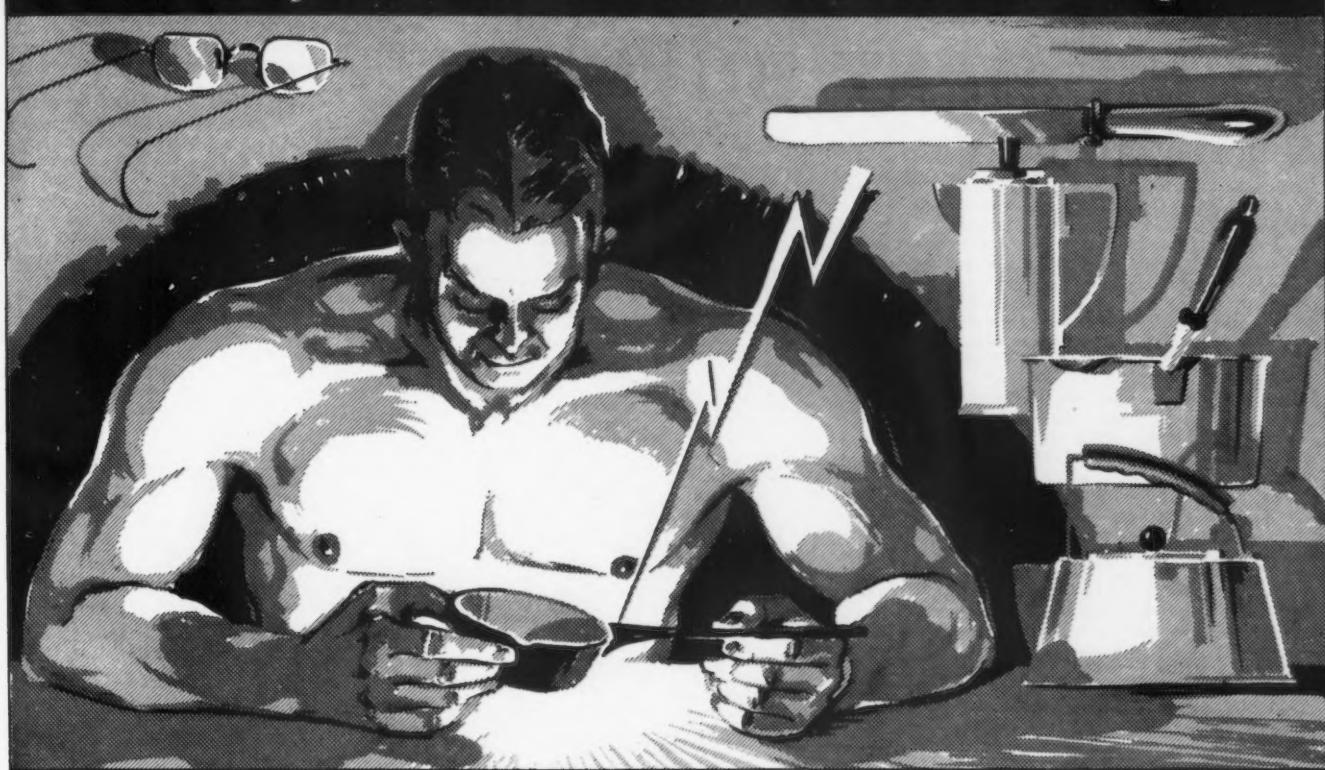
One of Detroit's large industrial companies recently completed a survey of possibilities for increased spending for machine tools and buildings. Highlight of the report finally prepared for this company's executives is the statement that millions of dollars are ready to be spent just as soon as the undivided profits and capital gains taxes are eased.

Better Tone in Pittsburgh; Steel Mills Buying

PITTSBURGH—A definite improvement in the number of machine tool inquiries is noticeable. The volume of orders has also increased slightly, and business so far this month is ahead of the corresponding January period. While some customers have shown a tendency to greatly curtail replacement programs, others have gone forward with little or no change in original intentions. The majority of inquiries and orders being received are emanating from customers who are scrapping obsolete equipment in order to offset to some extent increased manufacturing costs. That branch of the machine tool industry associated with steel mill accessory equipment continues exceptionally active. While the better tone in the machine tool market has not resulted in a marked increase in the total amount of business, it does reflect increases from the recent low level of activity.

Himmel Brothers Co., manufacturer of stainless steel store fronts, has moved its factory and offices from 200 Commerce Street, New Haven, Conn., to 1409-15 Dixwell Avenue, Hamden, Conn.

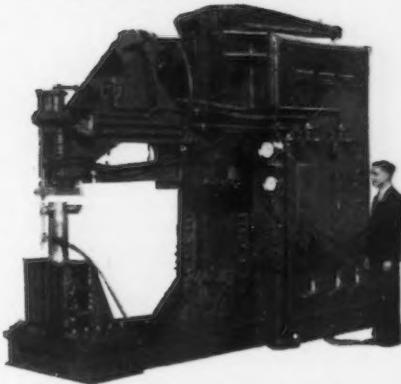
Always Consider Resistance Welding



RESISTANCE WELDING *Unites Both Similar and Dissimilar Metals*

That practically all similar metals can be united to form a strong joint more quickly, more efficiently and more economically by Resistance Welding than by any other known method, is today an accepted fact. But the service of Resistance Welding does not end there. It goes beyond this point to join ferrous to non-ferrous metals or dissimilar non-ferrous metals, the joint of which is as strong and often stronger than the weaker of the two metals. This type of Resistance Welding is employed in many large industries manufacturing small as well as large products. For example, in attaching steel cutting blades to handles of table knives, to connect steel coil springs to the gold shafts of eye glass frames, in the assembly of cooking utensils and scores of other dissimilar metal products.

Federal Engineers with 26 years of welding experience, are constantly meeting and solving metal fabrication problems . . . placing in the hands of alert, progressive manufacturers standard and special equipment for speedier, more efficient and more economical production. Your metal fabrication problems are our problems and we can solve them together. Our engineers are always at your command.



The Federal 1000 Series Spot and Projection Welder is the world's largest Spot Welder. Equipped with a 1250 KVA nominal rating transformer, the machine has a peak rating of 3200 KVA. As shown, the machine can be used to spot weld two pieces of aluminum $\frac{1}{8}$ inch thick, requiring 50,000 secondary amperes with a 72 inch throat depth. With the lower knee bolted on the face plate, heavy duty projection welding is done with the auxiliary upper arm removed. For spot welding, a maximum of 2200 lbs. is used while for projection welding 30,000 lbs. is available. This is accomplished with pneumatic cylinders with two additional cylinders available for long strokes. The machine is used in a railroad equipment building shop and weighs 22,500 pounds without timing control.

the
**FEDERAL**
MACHINE & WELDER CO.

SALES OFFICES IN -

WARREN, OHIO

ALL PRINCIPAL CITIES

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Refined Syrups, Inc., 120 Wall Street, New York, has purchased part of former sugar refinery of Spreckels Sugar Corp., Yonkers, N. Y., comprising about 10 acres, improved with five one and multi-story buildings. Structures will be modernized and new equipment installed for liquid sugar and syrup production, including tanks and mechanical-handling equipment. Facilities will be provided for about 400 employees. Cost about \$750,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 21 for one motor-driven universal die-sinking machine (Schedule 2816), 100,000 automatic fasteners (Schedule 2819), parts for storage batteries, and hydrometers (Schedule 2781), for Brooklyn Navy Yard; motor-driven universal milling machines, spare parts, tools and equipment (Schedule 2791) for Brooklyn and Philadelphia yards.

Pronto File Corp., 636 Broadway, New York, manufacturer of office filing equipment, has purchased through its affiliated interest, Solvie Realty Corp., a five-story building at 195-215 Front Street, Brooklyn, totaling about 193,000 sq. ft. of floor space, and will equip majority of structure for new plant.

Board of Education, Westhampton Beach, L. I., plans manual training department in new two-story junior high school, for which general contract has been let to John J. Dixon Co., Westhampton Beach. Cost over \$275,000.

American Viscose Corp., 200 Madison Avenue, New York, manufacturer of viscose rayon products, has work under way on initial units of new mill at Front Royal, Va., to include one and multi-story structures, power house, pumping station, machine shop and other mechanical departments. Buildings are scheduled to be ready for equipment installation in May. Cost over \$1,500,000 with machinery. A second mill unit to cost close to like sum will be built later. James Bennett is company engineer.

Quartermaster, West Point, N. Y., asks bids until Feb. 23 for bolts, screws, nails, tacks, vises, hand punches, steel mortar boxes, wire cloth and other equipment (Proposal 1052-76).

Rose Range Corp., 5 West Twenty-ninth Street, New York, gas ranges and parts, has leased two floors in building at 57 Pearl Street, about 30,000 sq. ft. of floor space, for plant, consolidating all divisions at new location. Arrangements have been made to lease additional space of about same size as soon as available in building.

Stainless Metals, Inc., 225 Fifth Avenue, New York, manufacturer of metal products, has leased one-story industrial building at 31-49 Twelfth Street, Long Island City, for plant.

Seggerman Nixon Corp., 99 Hudson Street, New York, wines and liquors, has leased 14,000 sq. ft. of floor space in Port Authority Commerce Building, 111 Eighth Avenue, for new storage and distributing plant.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Feb. 21 for gages, including thread ring, twin ring, progressive plug, snap, flush pin, etc. (Circular 619).

American Gas Machine Co., Albert Lea, Minn., manufacturer of stoves and parts, tanks and allied equipment, has leased one and two-story building to be erected at Ridgefield, N. J., by Bonanno Construction Co., 1827 Bergen Turnpike, North Bergen, N. J., for new Eastern factory branch, storage and distributing plant. Cost over \$75,000 with equipment.

National Transformer Co., Jersey City, N. J., manufacturer of electrical transformers and parts, has leased one-story building at 224-34 Twenty-first Street, Paterson, N. J.

about 21,000 sq. ft. of floor space, with option to purchase, and will improve for new plant, expanding present capacity.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for two 35-ton locomotive cranes for Navy Yard, Philadelphia (Specifications 8677).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Feb. 21 for one die filing machine (Circular 700).

John P. Kelly, 7126 Yocom Street, Philadelphia, manufacturer of brass and bronze castings, etc., has purchased a former one-story foundry at Twenty-third and Westmoreland Streets, totaling 15,000 sq. ft. of floor space, and will remodel for early occupancy.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 21 for one oxy-acetylene cutting machine (Schedule 2826); until Feb. 25, 34 sets of propeller control and accessory fittings for airplanes (Schedule 900-1504) for Philadelphia Navy Yard.

◀ BUFFALO DISTRICT ▶

Board of Education, Lockport, N. Y., plans manual training department in two new multi-story combination junior high schools, for which bids will be asked soon on general contract. Revised plans are being completed. Cost about \$900,000. Financing is being arranged.

Gordon Baking Co., 2303 East Vernor Street, Detroit, plans new one-story milk processing and condensing plant at Cuba, N. Y., where site is being selected. Cost close to \$50,000 with equipment.

◀ NEW ENGLAND ▶

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Feb. 23 for gages, including T-plug, flush pin, check, etc. (Circular 151).

Board of Contract and Supply, City Hall, Providence, R. I., asks bids until Feb. 21 for equipment for regional senior high school, Hope and Barnes Streets.

City Clerk, Administration Building, Springfield, Mass., asks bids until Feb. 24 for pumping machinery and auxiliary equipment for municipal sewage pumping station. Metcalf & Eddy, Statler Building, Boston, are engineers.

Aroostook Federation of Farmers, Caribou, Me., has authorized rebuilding part of commercial fertilizer plant recently destroyed by fire. Cost close to \$50,000 with equipment. J. P. Sullivan is general manager.

Board of Selectmen, Ashland, Mass., plan new pumping plant and steel standpipe for municipal water system. Cost over \$30,000.

Board of Selectmen, Stonington, Conn., plan manual training department in new two-story high school in Pawtucket district, for which general contract has just been let to Gustave Schreiber & Sons, Inc., Manchester, Conn. Cost about \$225,000. Fred S. Langdon, New London, Conn., is architect.

General Fire Extinguisher Co., West Exchange Street, Providence, R. I., plans one-story addition for storage and distribution, for which bids will be asked on general contract early in spring. Cost close to \$50,000 with equipment. Jenks & Ballou, Industrial Trust Building, are architects.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Feb. 23 for parts for automobiles (Circular 398-101); until Feb. 24, parts for locomotives (Circular 398-100).

Board of Baltimore County Commissioners,

Towson, Md., asks bids until Feb. 21 for pumping machinery and auxiliary equipment for two new sewage pumping plants at Essex and at head of Bak River, respectively. Samuel A. Green is chief engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 21 for 25,000 ft. of armored cable, quantity of insulated electric cable, copper cable, telephone cable, 50,000 ft. of telephone wire, magnet wire, one 2400-lb. hoist; two blue-printing machines, one blue-print dryer, transformers, brass terminal tubes, conduit elbows, junction boxes and other equipment (Schedule 3332).

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until March 3 for 180,000 seamless brass tubing sleeves, formed of hard, commercial high brass (Circular 247), 92,000 faceform blanks made from tinplate (Circular 240).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 21 for brass and steel bolts and nuts (Schedule 2750); until March 1, machine screws and nuts, and wood screws (Schedule 2780) for Eastern and Western Navy yards; until Feb. 21, one motor-driven gear shaper with fixtures and tools (Schedule 2766), one 50-ton, 30-ft. steel twin hopper car (Schedule 2814); until Feb. 25, three motor-driven, automatic screw machines, with tools and equipment (Schedules 2789, 2787 and 2812), one motor-driven milling machine (Schedule 2851), one motor-driven shaper (Schedule 2853) for Washington yard; one motor-driven deck winch with electric brake, one controller and spare parts (Schedule 2831) for Norfolk, Va., yard.

◀ SOUTH ATLANTIC ▶

Greenwood County Finance Board, Greenwood, S. C., E. L. Brooks, chairman, will receive bids until March 14 for power dam, power house and spillway for hydroelectric power project at Buzzard Roost. Closely following bids will be asked for hydraulic turbines and other power station equipment, electric traveling crane, penstocks, trash racks, tainter gates with hoisting machinery and other equipment. Entire project will cost over \$1,200,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 25 for spare parts for airplanes for naval air station, Pensacola, Fla. (Schedule 900-1494).

Columbia Coca-Cola Bottling Co., 1015 Main Street, Columbia, S. C., has let general contract to M. B. Kane Construction Co., 714 Lady Street, for two-story addition, 40 x 90 ft., to mechanical-bottling plant and improvements in present unit. Cost about \$55,000 with equipment. Lafaye & Lafaye, 1226 Sumter Street, are architects.

◀ SOUTH CENTRAL ▶

Standard Oil Co. of Kentucky, Inc., 430 West Bloom Street, Louisville, has let general contract to Noonan Construction Co., Pensacola, Fla., for new bulk oil terminal at Frisco wharf, Pensacola, comprising wharves and loading platforms, steel tanks, pumping station and other units. Cost about \$175,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Feb. 24 for steel plate nosing for draft tube piers and steel for draft tube gate guides for Guntersville and Chickamauga power plants; until March 2, one 275-ton overhead electric traveling crane for power house at Guntersville dam.

Mississippi River Commission, Vicksburg, Miss., asks bids until Feb. 25 for two 900-gal. per min. centrifugal pumping units, with direct-connected electric motors; also for one 1350-gal. per min. and one 1800-gal. per min. similar pumping units (Circular 16).

◀ SOUTHWEST ▶

United States Engineer Office, Manufacturers' Exchange Building, Kansas City, Mo., asks bids until Feb. 28 for one steam-driven

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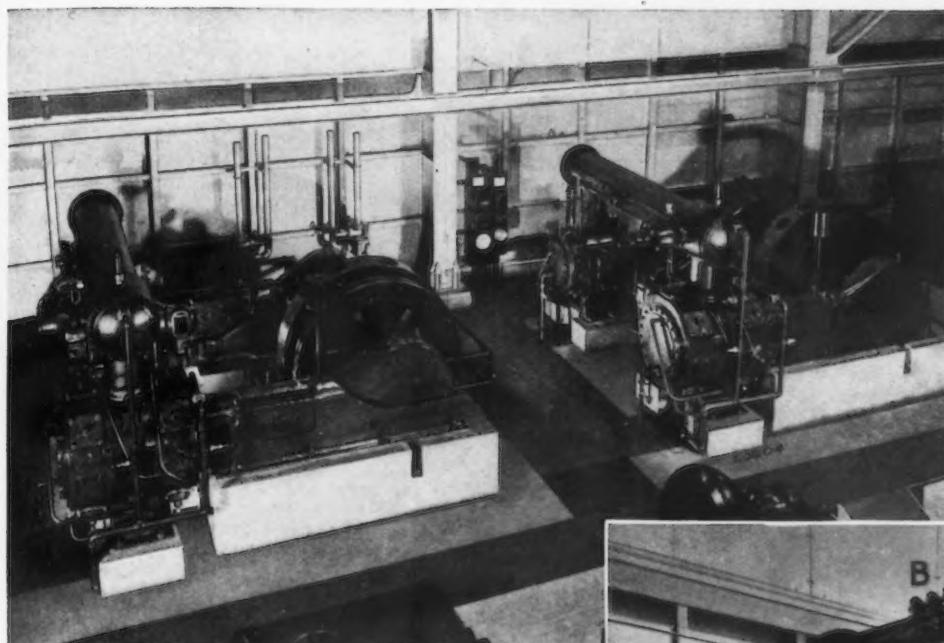
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JONES AND LAUGHLIN STEEL CORPORATION SELECTS WORTHINGTON COMPRESSORS

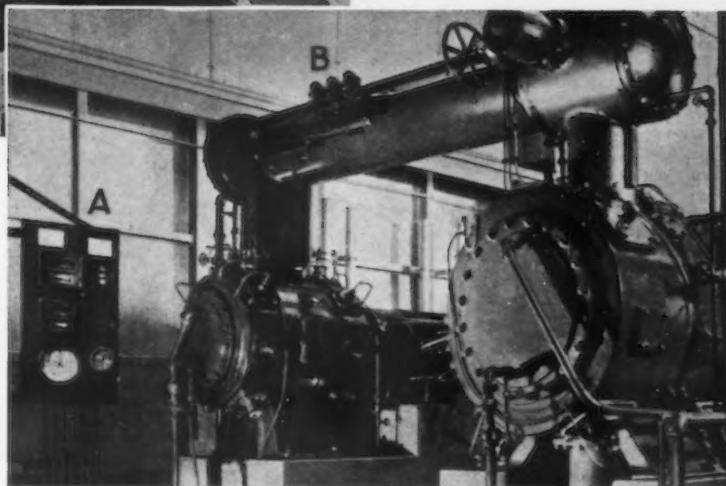


Each of these two units has a piston displacement of 3205 c.f.m. at 187.5 r.p.m. . . . Maximum operating pressure, 125 lb. per sq. in. . . . Driven by General Electric 600-hp. synchronous motors

THE continuously satisfactory performance of six Worthington Compressors installed at other Jones and Laughlin plants during the past few years determined the selection of these two new units for this corporation's new Pittsburgh mill.

Now, a total of eight direct-connected units...constituting 100% Worthington equipment of this type in the service of this important user...is a convincing testimonial of continued confidence in Worthington engineering and service.

for its new
96-inch
continuous
hot-strip
mill at
Pittsburgh



A UNIQUE FEATURE of this installation is the pressure control of both units from the class 50 governor panel (A). The two rectangular governor instruments on the panel, responding to changes in pressure, open and close electrical circuits to the solenoid valves (B) mounted on the compressor intercoolers. The solenoid valves load and unload the compressors by controlling the admission of air pressure to the unloading elements located in the compressor cylinders. Governors may be interchanged between compressors by electrically switching the solenoid valve connections.

MORE THAN 40 YEARS OF COMPRESSOR BUILDING EXPERIENCE

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electric generating set with accessory equipment (Circular 321).

Eason Oil Co., Enid, Okla., plans rebuilding part of gasoline refinery recently destroyed by fire. Loss about \$400,000 with cracking machinery and other equipment.

Frank's Machine Shop, Enid, Okla., manufacturer of machinery and parts, has filed plans for one-story machine shop addition. Cost about \$25,000 with equipment.

Board of Trustees, Oklahoma Agricultural and Mechanical College, Stillwater, Okla., has asked bids on general contract for new two and four-story, L-shaped engineering building, 72 x 161 ft., and 84 x 101 ft., respectively. Cost about \$300,000 with mechanical equipment. Winkler & Reid, Savings Bank Building, Oklahoma City, are architects; Philip A. Wilber, Stillwater, is associate architect.

Royal Crown Coca-Cola Co., Corpus Christi, Tex., has plans for new two-story mechanical-bottling plant at 629 Chamberlain Avenue. Cost over \$45,000 with equipment. Richard S. Colley, Jones Building, is architect.

Portex Oil Co., Joaquin, Tex., has plans for new gasoline refinery, with steel tank storage facilities, pumping station, power house and other units. Cost close to \$90,000 with equipment.

Coleman County Electric Co-operative, Inc., Coleman, Tex., C. W. Pitts, president, asks bids until Feb. 23 for rural power and distributing lines in parts of Coleman County, about 101 miles, including wire and cable, pole hardware and fittings, service facilities, etc. Cost close to \$100,000. William G. Morrison, Professional Building, Waco, Tex., is engineer.

Nowery J. Smith Supply Co., 3610 McKinney Street, Houston, Tex., manufacturer of oil well equipment and supplies, drilling machinery, parts, etc., has acquired about 11-acre tract in Eureka Junction district for new plant for parts production and assembling, with power house and auxiliary buildings. Cost over \$125,000 with equipment.

WESTERN PA. DIST.

Homestead Ice Co., 207 West Seventh Street, Homestead, Pittsburgh, has plans for one-story addition to local brewery for mechanical-bottling works. Cost close to \$75,000 with equipment. W. J. O'Connor is engineer in charge of construction.

Youghiogheny & Ohio Coal Co., Commonwealth Building, Pittsburgh, plans coal mining plant at coal properties to be opened up and operated near Bandy, W. Va. Installation will include machinery for large output, with shops and other structures and five-track tipple. Cost over \$250,000 with equipment. Company has leased tract of 2300 acres of coal lands in district noted.

Texas Co., 135 East Forty-second Street, New York, plans new bulk oil and gasoline terminal on water front at Huntington, W. Va., including unloading facilities, tanks and other structures. Cost over \$80,000 with equipment.

MICHIGAN DISTRICT

Hall Electric Co., Muskegon, Mich., manufacturer of electrical products, has let general contract to Muskegon Construction Co., Muskegon, for one-story addition for storage and distribution. Cost about \$30,000 with equipment.

Bay Mfg. Division, Electric Auto-Lite Co., Bay City, Mich., manufacturer of gages and other precision instruments, has begun construction of addition to steam power house, to include installation of a new 750-hp. boiler unit and auxiliary equipment. Cost about \$45,000.

Bower Roller Bearing Co., 3040 Hart Street, Detroit, has let general contract to Austin Co., Curtis Building, for one-story addition. Cost about \$25,000 with equipment.

City Council, Bessemer, Mich., has plans for new municipal electric power plant, with installation of two 320-kw. diesel engine-generator units, two 15,000-gal. fuel oil storage tanks, pumping machinery and auxiliary

equipment. Cost about \$187,000. Financing has been arranged through Federal aid. James H. Trebilcock is city engineer.

OHIO AND INDIANA

National Gypsum Co., Niles, Ohio, has plans for one-story addition for storage and distribution. Cost close to \$45,000 with equipment. Keith & O'Brien, Union Savings & Trust Building, Warren, Ohio, are architects.

Public Works Department, Cincinnati, Col. C. O. Sherrill, City Hall, city manager, plans new one and multi-story municipal service, repair and garage building, near John and George Streets, for city-owned motor trucks and cars. Cost about \$250,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects.

Board of Trustees, Antioch College, Yellow Springs, Ohio, plans extensions and improvements in power house, including new 300-kw. diesel engine-generator unit and auxiliary equipment. Cost about \$50,000.

Wides Pipe & Supply Co., 1726 John Street, Cincinnati, iron and steel pipe and kindred equipment, has acquired former plant of McMyler-Interstate Co., Bedford, Ohio, comprising group of one-story buildings, and will remodel for new plant.

Contracting Officer, Materiel Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 21 for two 16-in. motor-driven tool room precision lathes, one 13-in. tool room precision lathe (Circular 681); until Feb. 24, steel cotter pins and taper pins (Circular 679), 10 radiator assemblies (Circular 678); until Feb. 25, drain cocks, shut-off cocks, brass nipples and air nozzles (Circular 682), 25,200 brass grommets, 75,000 facing eyelets, hinge hasps, tee hinges, brass butt hinges, etc. (Circular 686); until Feb. 28, 137 to 250 remote control adapter assemblies (Circular 691); until March 1, 1000 bomb release handle assemblies, and 500 to 1015 flare type rack assemblies (Circular 692), about 5500 self-locking padlocks (Circular 696).

MIDDLE WEST

Illinois Zinc Co., 332 South Michigan Avenue, Chicago, has acquired tract, 130 x 775 ft., on Forty-seventh Street, Kenwood industrial district, for new mill for production of strip zinc, special zinc alloys and allied zinc specialties. Plans are being completed by Austin Co., 510 North Michigan Avenue, engineer, which also has secured contract for erection. Cost about \$400,000 with machinery. Company operates a zinc mining plant at Hanover, N. M., with smelter at Dumas, Tex.

Commanding Officer, Ordnance Department, Rock Island (Ill.) Arsenal, asks bids until March 1 for one heavy tractor crane, full track-laying; two heavy tractor cranes, four medium tractors with diesel engine and power take-off, one 1-ton full track-laying tractor crane (Circular 455).

Swift & Co., Union Stock Yards, Chicago, plan new cottonseed oil mill near Blytheville, Ark., with power house, machine shop, pumping station and other mechanical departments. A division will be installed for soy bean oil processing. Cost close to \$350,000 with equipment.

United States Engineer Office, Clock Tower Building, Rock Island, Ill., asks bids until Feb. 23 for lock-operating machinery and spare parts for locks on Mississippi River; three lock gate-operating motors, two valve-operating motors; four torque motors for brake and six brake drums (Circular 195); until Feb. 24, power, control and lighting system at lock and dam No. 13, Mississippi River, near Clinton, Iowa, comprising all central control station equipment, transformers and regulators, four miter gate-operating machines, gasoline-electric standby power unit, two electric tow-haulage units, hand-operated traveling bridge crane and electrical and mechanical equipment (Circular 197).

Common Council, Onawa, Iowa, asks bids until March 2 for extensions and improve-

ments in municipal electric power plant, including one 625-hp. diesel engine-generator unit and accessories, steel fuel oil storage tank, switchboards and accessory equipment. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is consulting engineer.

Hummel & Downing Co., Milwaukee, manufacturer of paper and fiber box board and containers, will invest approximately \$150,000 in new machinery and other equipment to be installed in space now occupied by office and storage facilities. These will be replaced by new warehouse and office to be erected at once at cost of \$200,000. Negotiations also are under way for purchase of one machine shop unit, 180 x 500 ft., of former National Brake & Electric Co., now used for storage under lease.

Marsfield, Wis., Electric and Water Department, George Marvin, secretary, has engaged Helmick, Edeskut & Lutz, 503 Essex Building, Minneapolis, Minn., as consulting engineers on \$100,000 plant improvement project.

American Hollow Steel Vise Co., has established a factory at 3220 West Fond du Lac Avenue, Milwaukee.

Smith Steel Foundry Co., Milwaukee, is completing installation of a one-ton arc-melting furnace and auxiliary equipment for production of high alloy-steel castings in relatively small quantities according to a wide variety of analyses desired by its customers.

Globe Co., Sheboygan, Wis., established in 1917 to manufacture a general line of metal stampings and tools, jigs and dies, has announced discontinuance of operations as of Feb. 1. According to Fred Leicht, general manager, negotiations now under way for disposition of factory, equipment and material inventory probably will insure resumption of production under new ownership soon.

PACIFIC COAST

Coca-Cola Co., Third Division, 963 East Fourth Street, Los Angeles, has acquired tract near Third Street and Carroll Avenue, San Francisco, for new beverage plant for Pacific Coast trade, with mechanical-bottling, storage and distributing departments. A power house will be built. Bids on general contract are scheduled to be asked in spring. Cost close to \$1,000,000 with machinery. Main offices of company are at Atlanta, Ga.

Standard Battery Separator Co., 2446 East Fifty-third Street, Los Angeles, has plans for new works at 4401 Shiela Avenue, Banning district, with total floor space of about 70,000 sq. ft. Cost close to \$100,000 with equipment. William J. Moran, 1011 South Fremont Avenue, Alhambra, Cal., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 25 for propeller blades for airplanes (Schedule 900-1484) for Naval Air Station, San Diego; until March 1, one motor-driven engine lathe (Schedule 2829) for Mare Island Navy Yard; until March 4, motor-driven milling machine (Schedule 2838) for Keyport, Wash., yard.

Nehi Bottling Co., 121 East Fremont Street, Stockton, Cal., has let general contract to T. E. Williamson, Stockton, for one-story mechanical-bottling plant. Cost about \$45,000 with equipment.

Bureau of Water and Power, 207 South Broadway, Los Angeles, plans new underground headquarters at First and Boylston Streets, consisting of a three-story shop unit, 55 x 80 ft., one-story shop, 20 x 80 ft., two-story equipment storage and distributing building, 160 x 180 ft., with service and garage facilities for department motor trucks and cars, and one-story cable building, 45 x 110 ft. Cost about \$568,000 with equipment. Plans also are under way for new range, water heater and service building and shop on Wright Street, two stories, 40 x 150 ft. Cost close to \$90,000 with equipment.

Hood River Apple Growers' Association, Hood River, Ore., plans rebuilding part of four-story packing plant occupying a square block of property, recently destroyed by fire. Loss about \$125,000 with mechanical-handling and other equipment.